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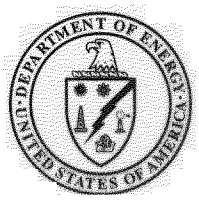
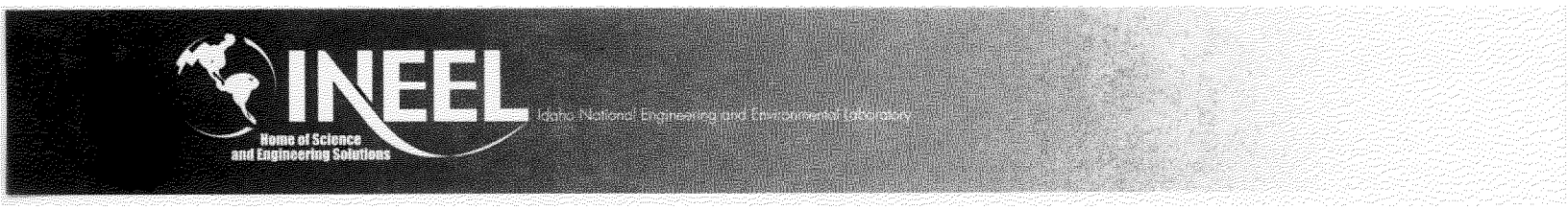


U.S. Department of Energy
Idaho Operations Office

Group 3 Remedial Design/Remedial Action Work Plan Addendum 1 for TSF-26, PM-2A Tanks – Phase 1 Tank Removal and Site Remediation for Test Area North, Waste Area Group 1, Operable Unit 1-10



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Revision 0

Approved by

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ABSTRACT

This Comprehensive Environmental Response, Compensation, and Liability Act remedial design/remedial action work plan addendum has been developed in accordance with the Idaho National Engineering and Environmental Laboratory Federal Facility Agreement and Consent Order to present the remedial design and the remedial action work plan for implementing Phase 1 of the Waste Area Group 1, Operable Unit 1-10, Group 3 remedial actions at the Test Area North/Technical Support Facility PM-2A tanks site. During development of the remedial design/remedial action work plan addressing the Group 3 sites at Test Area North and further planning to support accelerated cleanup at Test Area North, a significant change to the remedy selected in the Operable Unit 1-10 record of decision was identified. The revised remedy includes removing the tanks whole with the waste remaining in the tanks and placing the tanks in a Comprehensive Environmental Response, Compensation, and Liability Act storage area, treating the contents, as necessary, and disposing of the waste and the tanks. Because of the accelerated timeframe, the new remedy will be implemented via two addenda to the original work plan. This addendum, Addendum 1, addresses Phase 1 remedial actions, which include tank removal and site restoration. Addendum 2 will address Phase 2 remedial actions, which include tank contents' treatment and disposal. This remedial design/remedial action work plan addendum and its supporting documents provide details of the site and its associated contaminants, design and regulatory requirements, remediation tasks, project organization, schedules, and cost estimates.

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FIGURES

TABLES

ACRONYMS

ALARA	as low as reasonably achievable
APAD	Air Permitting Applicability Determinations
ARARs	applicable or relevant and appropriate requirements
BBWI	Bechtel BWXT Idaho, LLC
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
D&D	decontamination and decommissioning
DE	diatomaceous earth
DOE	Department of Energy
DOE-Idaho	Department of Energy Idaho Operations Office
DOT	Department of Transportation
EPA	Environmental Protection Agency
ESD	explanation of significant differences
FFA/CO	Federal Facility Agreement and Consent Order
FRG	final remediation goal
FSP	field sampling plan
HASP	health and safety plan
HWD	hazardous waste determination
HWMA	Hazardous Waste Management Act
IC	institutional controls
ICDF	INEEL CERCLA Disposal Facility
INEEL	Idaho National Engineering and Environmental Laboratory
LDR	land disposal restriction
NDE/UT	nondestructive examination/ultrasonic examination

NLCID	no longer contained in determination
O&M	operations and maintenance
OU	operable unit
P&T	packaging and transportation
PM	project manager
RA	remedial action
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RD	remedial design
RD/RAWP	remedial design/remedial action work plan
RI/FS	remedial investigation/feasibility study
ROD	record of decision
RWMC	Radioactive Waste Management Complex
SPC	specification
TAN	Test Area North
TFR	technical and functional requirements
TSF	Technical Support Facility
USC	U.S. Code
WAC	waste acceptance criteria
WAG	waste area group
WGS	Waste Generator Services
WMP	waste management plan
WRRTF	Water Reactor Research Test Facility

Group 3 Remedial Design/Remedial Action Work Plan Addendum 1 for TSF-26, PM-2A Tanks – Phase 1 Tank Removal and Site Remediation for Test Area North, Waste Area Group 1, Operable Unit 1-10

1. INTRODUCTION

This remedial design/remedial action work plan (RD/RAWP) addendum has been prepared by the Department of Energy Idaho Operations Office (DOE-Idaho) in accordance with the Idaho National Engineering and Environmental Laboratory (INEEL) Federal Facility Agreement and Consent Order (FFA/CO) (DOE-ID 1991). This RD/RAWP addendum addresses the implementation of a portion (Phase 1) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S. Code [USC] § 9601 et seq., 1980) remedy for the Technical Support Facility (TSF)-26 PM-2A tanks. This CERCLA RD/RAWP addendum will proceed in accordance with the signed record of decision (ROD) for Operable Unit (OU) 1-10 (DOE-ID 1999) and the signed *Record of Decision Amendment for the V-Tanks (TSF-09 and TSF-18) and Explanation of Significant Differences for the PM-2A tanks (TSF-26) and TSF-06, Area 10, at Test Area North, Operable Unit 1-10 at the Idaho National Engineering and Environmental Laboratory, Idaho Falls, Idaho* (DOE-ID 2004a).

As part of CERCLA, the release sites at Test Area North (TAN) OU 1-10 were evaluated through a comprehensive remedial investigation/feasibility study (RI/FS) (DOE-ID 1997). The RI/FS assessed the investigations previously conducted for Waste Area Group (WAG) 1, thoroughly investigated the sites not previously evaluated, and determined the overall risk posed by the WAG. The OU 1-10 RI/FS culminated with the finalization of the OU 1-10 ROD (DOE-ID 1999). The ROD identified eight sites requiring remedial action (RA) and the remedies for each. To facilitate remediation, and as agreed to by Environmental Protection Agency (EPA) Region 10, State of Idaho Department of Environmental Quality, and DOE-Idaho, hereinafter referred to as the Agencies, the eight sites requiring remediation in WAG 1 were divided into three groups. The sites included in each group are presented in Table 1-1.

Table 1-1. Waste Area Group 1, Operable Unit 1-10 sites requiring remedial action or limited action in the original record of decision.

Group	Sites
Group 1	TSF-06, Area B, Soil Contamination Area South of the Turntable, TSF-07 Disposal Pond, WRRTF-13 Fuel Leak Site, and TSF-26 Surface Soil Contamination
Group 2	TSF-09 and TSF-18 V-Tanks
Group 3	TSF-26 PM-2A Tanks, TSF-03 Burn Pit, and WRRTF-01 Burn Pits

The TSF-26 site was further subdivided for remediation purposes. The TSF-26 surface soils included in Group 1 are assumed to extend to 10 ft below the original ground surface (bgs) in the area above the PM-2A tanks. The remaining soil above the tanks, the tanks themselves, the cradles and associated sand pads, and any ancillary piping are considered to be the PM-2A tanks site within Group 3. An original remediation approach for the PM-2A tanks was addressed in *Remedial Design/Remedial Action Work Plan for Group 3, PM-2A Tanks and Burn Pits for Test Area North, Waste Area Group 1, Operable Unit 1-10* (DOE-ID 2003a).

This RD/RAWP addendum has been prepared to address changes made to the original selected remedy, as documented in the explanation of significant differences (ESD) section of the ROD amendment (DOE-ID 2004a). Based on reevaluation of the remedial design (RD) for the PM-2A tanks and planning to support accelerated cleanup at TAN, a significant change to the remedy selected in the OU 1-10 ROD was identified. Specifically, rather than removing the waste inventory and treating as necessary, decontaminating the tanks, and leaving the tanks in place, the tanks will be removed with the waste inventory in the tanks, the waste inventory treated, as necessary, and the tanks and the waste disposed of as CERCLA remediation-derived waste at the INEEL CERCLA Disposal Facility (ICDF) or other approved facility. In accordance with the requirements specified in the Hazardous Waste Management Act (HWMA) (HWMA 1983)/Resource Conservation and Recovery Act (RCRA) (42 USC 6901 et seq., 1976) closure plan (DOE-ID 2004b) feed piping to the PM-2A tanks will be removed and disposed.

Implementation of the revised remedy for the PM-2A tanks will be conducted under two addenda to the Group 3 RD/RAWP. This addendum, Addendum 1, addresses tank removal and site remediation (Phase 1). A separate addendum will be prepared addressing waste treatment, as necessary, and final waste and tank disposition (Phase 2). The scope of the original RD/RAWP and addenda is summarized in Table 1-2.

Table 1-2. Scope of Group 3 RD/RAWP and PM-2A tanks RD/RAWP, Addendum 1 and Addendum 2.

RD/RAWP Documentation	Scope
Group 3 RD/RA Work Plan	• PM-2A tank contents sampling • Site preparation and partial piping removal and disposal
Addendum 1	• Excavation for tank removal • Tank removal with waste inventory in the tanks • Hazardous Waste Management Act/Resource Conservation and Recovery Act closure activities • Contaminated soil removal and disposal • Site backfill and restoration
Addendum 2	• Waste treatment, as necessary • Tank and waste disposal

1.1 Document Organization

This section provides the outline of this RD/RAWP addendum including appendixes, attachments, and a list of the supporting documents.

1.1.1 RD/RAWP Addendum

This document presents the combined RD/RAWP for implementing a portion of the PM-2A tanks site remediation, tank removal, and site restoration. This RD/RAWP addendum and its supporting documents provide details of the site and its associated contaminants, design and regulatory requirements, remediation tasks, project organization, schedules, and cost estimates. Brief descriptions of the sections of this plan and the appendixes and attachments are provided as follows:

Section 1 – Introduction

Section 1 provides the scope and purpose of the RD/RAWP addendum and how the scope fits within the overall OU 1-10 site remediation. Section 1 includes:

- Document Organization—Identifies how the document is organized and identifies supporting documents
- Background—Provides historical background and regulatory history of WAG 1 and the TSF-26, PM-2A tanks remediation site
- Remediation Approach Overview—Provides an overview of the remediation approach for the TSF-26, PM-2A tanks.

Section 2 – Design Basis and Requirements

Section 2 summarizes the remedial action objectives, how the criteria specified in the ROD will be satisfied, and provides a summary of requirements and criteria necessary to complete the remedial action. Section 2 includes:

- Remedial Action Objectives—Identifies the remedial action objectives for the TSF-26, PM-2A tanks as stated in the OU 1-10 ROD (DOE-ID 1999) and ROD amendment and ESD for the PM-2A tanks (DOE-ID 2004a). Also identifies the final remediation goals and the HWMA/RCRA closure requirements.
- ROD Remedy Implementation Approach and Performance Criteria—Identifies the remedy elements from the OU 1-10 ROD (DOE-ID 1999) and ROD amendment and ESD for the PM-2A tanks (DOE-ID 2004a) and presents the implementation approach and performance criteria for each element.
- General Requirements—Identifies the general requirements that must be addressed and implemented in the RD/RAWP including ROD applicable or relevant and appropriate requirements (ARARs), Department of Energy (DOE) orders and standards, and INEEL requirements.
- Design Criteria—Based on the general project requirements, regulatory requirements, and technical and functional requirements (TFRs), identifies the project-specific design criteria developed to provide additional basis for the remedial design.

Section 3 – Uncertainty Management

Section 3 identifies uncertainties and potential risks related to the remedial design and/or the remedial action and identifies measures to resolve or mitigate the risks.

Section 4 – Remedial Design

Section 4 provides details related to the remedial design and references specific design criteria and design elements. Section 4 includes:

- Design Overview—General description of the overall design and summary of the design elements including process and/or work flow diagrams and identification of design analyses/calculations performed

- Design Assumptions—General and specific assumption that apply to the design

- Detailed Design Description—Detailed description of each design element; equipment, component, and instrument lists; drawing and specification (SPC) list.

Section 5 – Environment, Safety, Health, and Quality

Section 5 discusses how environmental, health and safety, and quality requirements will be met through compliance with various project documents and processes.

Section 6 – Remedial Action Work Plan

Section 6 describes the controls and protocols developed for the Group 3 remedial actions, identifies the remediation tasks, and discusses the interfaces for each remediation task. Inspection requirements and documents supporting this work plan are identified and discussed.

Section 7 – Changes to the Remedial Design/Remediation Action Scope of Work

Section 7 identifies changes to the ROD-selected remedies, as documented in the ESD (DOE-ID 2004a).

Section 8 – Five-Year Review

Section 8 discusses the requirements for five-year reviews of the remedy to ensure protection of human health and the environment.

Section 9 – References

Section 9 lists the references used to prepare this RD/RAWP addendum.

Appendix A – Applicable or Relevant and Appropriate Requirements Implementation

Appendix A provides implementation approach and strategy for the ARARs.

Appendix B – Air Permitting Applicability Determination

Appendix B provides the applicability determination for air permitting for Phase 1 remedial actions.

Appendix C – Project Calculations and Analyses

Appendix C provides project calculations and analyses that are relevant to and/or support the design with respect to ARAR implementation.

Appendix D – Cost Estimate for Remedial Action

Appendix D provides a cost estimate for implementation of the remedial action.

Appendix E – Safety Category Evaluation

Appendix E summarizes the safety category evaluation(s) associated with remedial action activities and the controls necessary to safely execute the remedial action.

Appendix F – Agency Comment Resolution Forms

Appendix F presents Agency comments and how each comment was resolved.

Appendix G – Remedial Action Sequencing Sketches

Appendix G provides the general sequences for the remediation activities.

Attachment 1 – PM-2A Tanks Design Drawings

Attachment 1 contains design drawings associated with implementation of the remedial action.

Attachment 2 – PM-2A Tanks Design Specifications

Attachment 2 contains design SPCs and requirements associated with implementation of the remedial action.

1.1.2 RD/RAWP Addendum Supporting Documents

Several documents have been prepared or revised to supplement this RD/RAWP addendum and support the implementation of the remedial action. The supporting documents include:

- *Field Sampling Plan for Group 3, PM-2A Tanks for Test Area North, Waste Area Group 1, Operable Unit 1-10*, DOE/ID-11078, Rev. 1, June 2004 (DOE-ID 2004c).
- *Waste Management Plan for Group 3, PM-2A Tanks and Burn Pits, for Test Area North, Waste Area Group 1, Operable Unit 1-10*, INEEL/EXT-03-00284, Rev. 1, June 2004 (INEEL 2004a).
- *Decontamination Plan for Group 3, PM-2A Tanks and TSF-03 Burn Pit for Test Area North, Waste Area Group 1, Operable Unit 1-10*, INEEL/EXT-03-00283, Rev. 1, June 2004 (INEEL 2004b).
- *Hazardous Waste Management Act/Resource Conservation and Recovery Act Closure Plan for the Test Area North/Technical Support Facility Intermediate-Level Radioactive Waste Management System, Phase III: Intermediate-Level Radioactive Waste Holding Tank Subsystem (PM-2A Tanks)*, DOE/ID-11076, Rev. 3, February 2004 (DOE-ID 2004b).

1.2 Background

The INEEL is a DOE facility located in southeastern Idaho, 51.5 km (32 mi) west of Idaho Falls, and encompasses approximately 2,305 km^2 (890 mi^2) of the northeastern portion of the Eastern Snake River Plain. The TAN facility is approximately a 41-ha (102-acre) area, located in the north-central portion of the INEEL (see Figure 1-1). The area originally included four different facilities: (1) the TSF, (2) the Initial Engine Test facility, (3) the Water Reactor Research Test facility (WRRTF), and (4) the Specific Manufacturing Capability/Loss-of-Fluid Test facility. Since its construction in 1954, TAN has supported numerous research and testing projects, including development and testing of designs for nuclear-powered aircraft engines, reactor safety testing and behavior studies, armor manufacturing, nuclear inspections, and storage operations.

The TAN WAG 1 is one of 10 INEEL WAGs identified in the FFA/CO (DOE-ID 1991) by the Agencies. Operable Unit 1-10 is listed as the WAG 1 comprehensive RI/FS in the FFA/CO. The purpose of the RI/FS was to assess the investigations previously conducted for WAG 1, thoroughly investigate the

sites not previously evaluated, and determine the overall risk posed by the WAG. The final ROD for the OU 1-10 sites identifies the remedies selected for eight of these sites that might present an imminent and substantial endangerment to human health and the environment. These eight sites were initially investigated in other OUs in WAG 1 and were later incorporated into OU 1-10 for the RI/FS and ROD.

The PM-2A tanks site consists of two abandoned 189,270-L (50,000-gal) underground carbon steel storage tanks, their concrete cradles and associated sand pads, associated piping, the waste content of the tanks, and the contaminated soils around them (see Figure 1-2). The tanks were installed in the mid-1950s to store low-level radioactive waste from the TAN/TSF Intermediate-Level Radioactive Waste Management System evaporator (TAN-616 evaporator). In the early 1970s the TAN-616 evaporator was removed from service and a temporary evaporator system (PM-2A evaporator) was constructed at ground level above the PM-2A tanks. The PM-2A tanks were used as feed tanks for the newly installed evaporator system and may have received raw liquid waste directly from the TAN/TSF Intermediate-Level Radioactive Waste Management System feed tanks (V-tanks). In 1975 the PM-2A evaporator system was taken out of service because it was determined that shipping the waste to the Idaho Nuclear Technology and Engineering Center for treatment was more cost-effective than continued operation of the PM-2A evaporator system. The PM-2A tanks did not receive waste after 1975. In 1981 decommissioning and decontamination (D&D) of the PM-2A evaporator system was conducted. The bulk waste inventory in the PM-2A tanks was pumped from the tanks to concrete containers, mixed with cement, and shipped to the Radioactive Waste Management Complex (RWMC) for disposal.

Each of the 5/8-in.-thick carbon steel PM-2A tanks has a capacity of 189,270 L (50,000 gal) and is buried. Each horizontal tank, measuring 3.8 m (12.5 ft) in diameter and 16.8 m (55 ft) in length, lies in a concrete cradle (V-shaped cradles that are approximately 19.8 m [65 ft] in length and 2.7 m [9 ft] in depth). The tops of the tanks lie approximately 3.7 m (12 ft) below the existing ground surface. The bottoms of the cradles are approximately 9.1 m (30 ft) below original ground surface. Each tank is equipped with a vent and a manhole/manway. Figure 1-3 shows the expected tank configuration based on available information.

Following bulk waste removal activities conducted during D&D activities of the PM-2A evaporator system, the east tank (V-13; see Figure 1-3) contained approximately 7,041 L (1,860 gal) of sludge that was approximately 12 in. thick and covered by 1/4 in. of liquid. The west tank (V-14) contained approximately 1,363 L (360 gal) of sludge covered by 1 1/2 in. of liquid. Approximately 10,000 lb of diatomaceous earth (DE) was then deposited into each tank, forming a layer estimated to be 8 in. thick. The tank configuration and contents are depicted in Figure 1-3. A photograph of the inside of the east tank (V-13), after the addition of DE, is provided in Figure 1-4.

The tanks currently contain F001-listed, mixed low-level waste contaminated with radionuclides and volatile organic compounds. Diatomaceous earth was added to the tanks during the D&D activities to absorb free liquid. However, a recent video of the tank interiors by Bechtel BWXT Idaho, LLC (BBWI) shows some liquid in the west tank. The soil above and in the general area of the tanks was contaminated from occasional spills during routine operations, and from leaks and spills during the removal and treatment of the liquid waste. Approximately 6 ft of surface soil above the PM-2A tanks has been removed during previous TSF-26 Group 1 activities. An additional 2 ft of surface soil will be removed prior to tank excavation leaving approximately 2 ft of Group 1 soils above the tanks to be handled under the Group 3 remediation. Soil sampling conducted by BBWI in spring 2003 indicates that some Cs-137 contamination >23.3 pCi/g exists in the soil above the PM-2A tanks (Hain 2003).

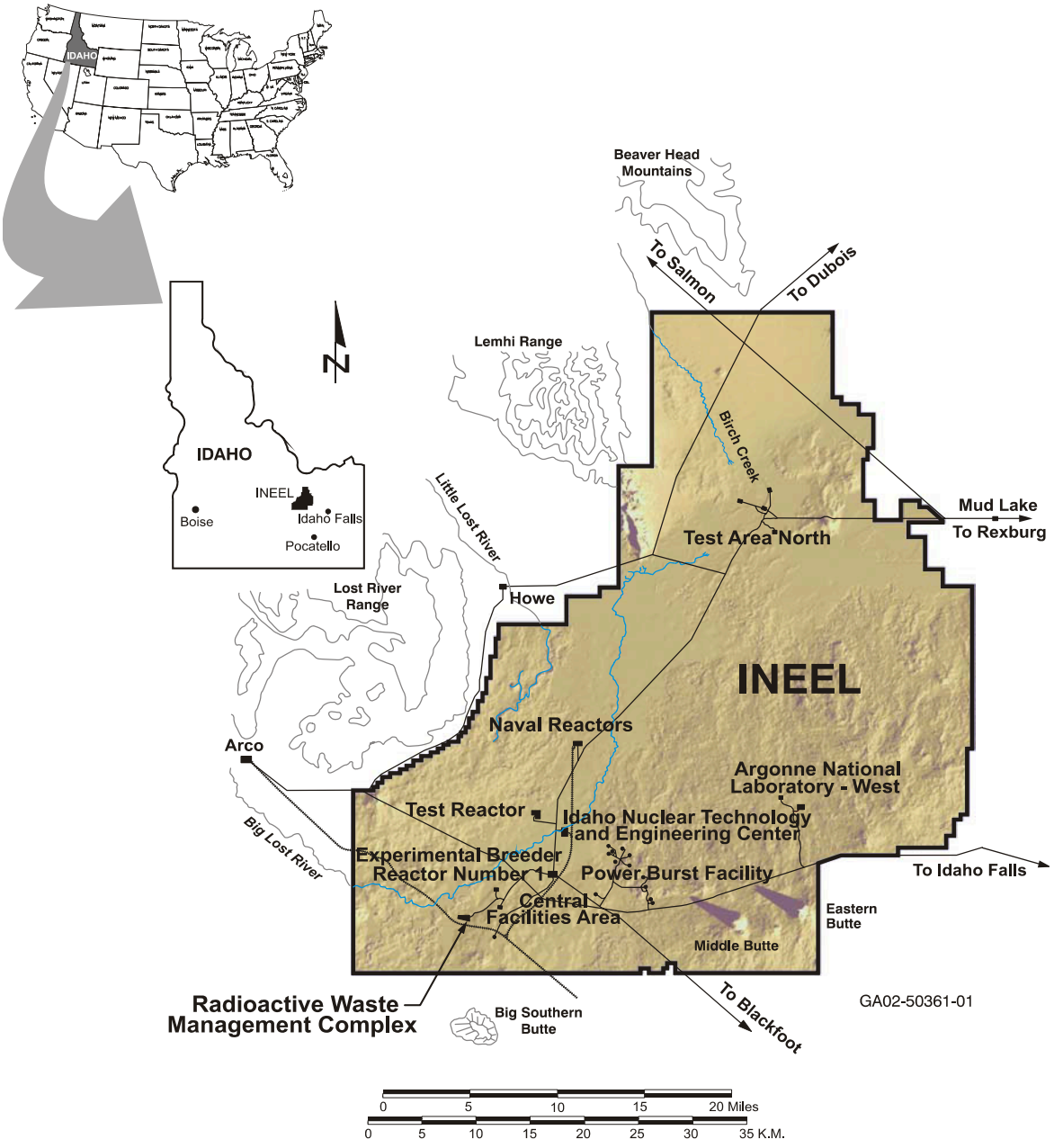


Figure 1-1. Location of the Idaho National Engineering and Environmental Laboratory.

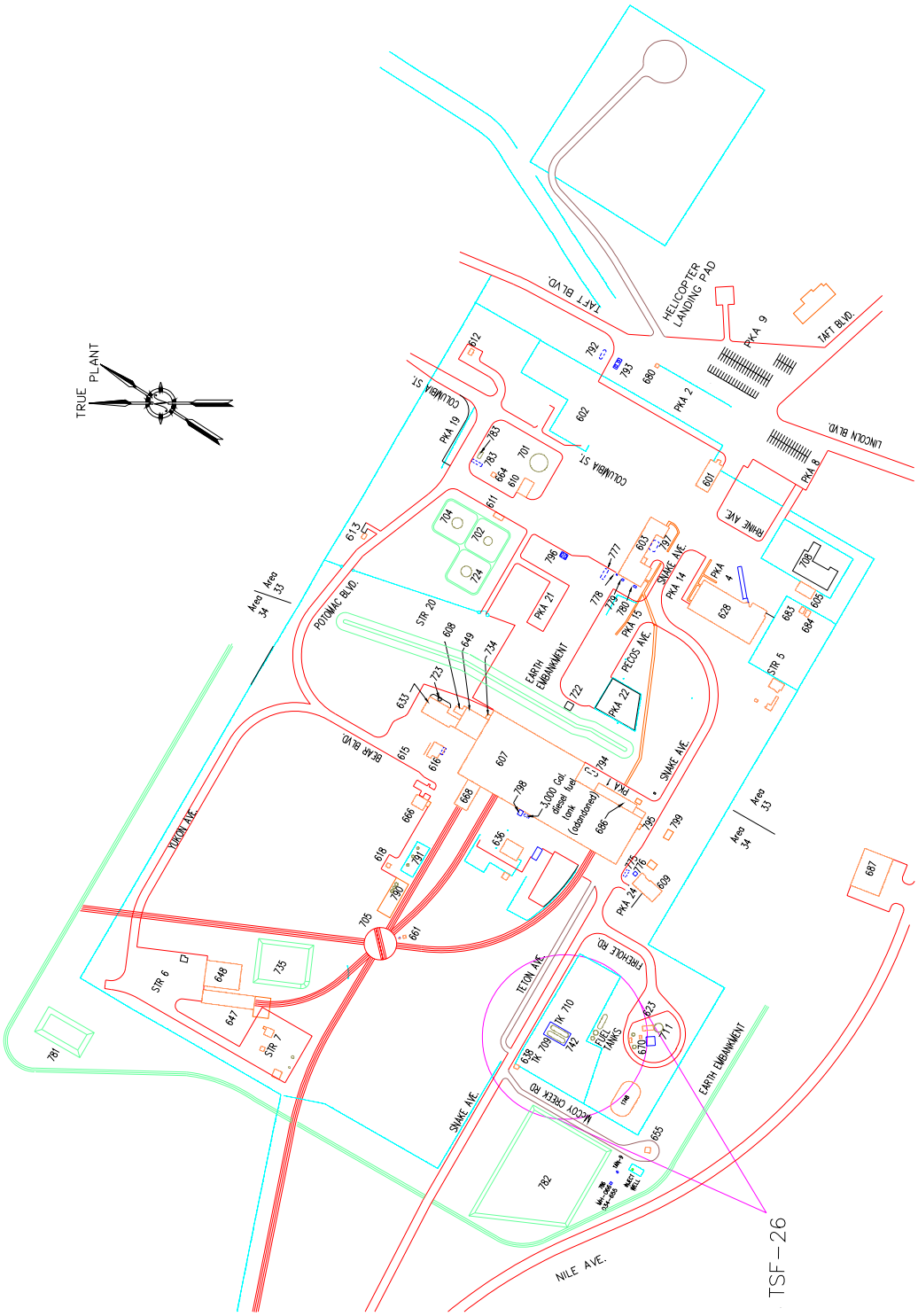
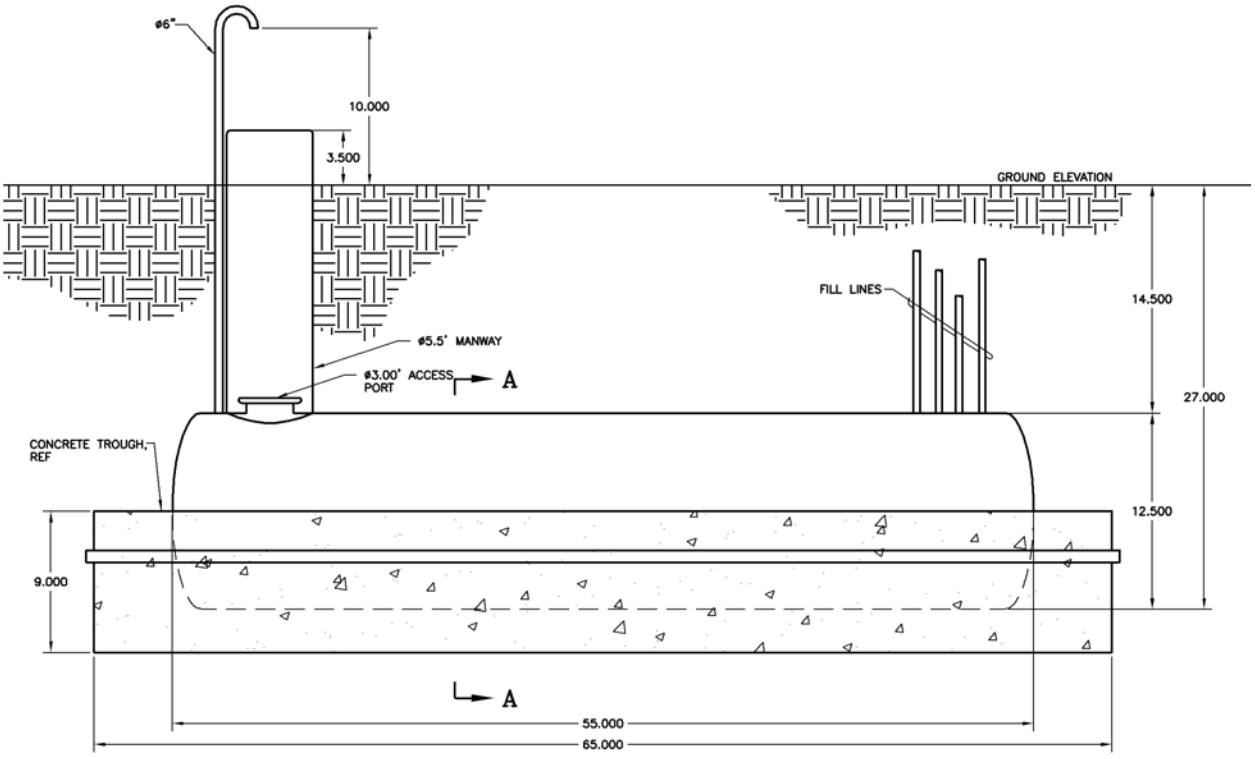
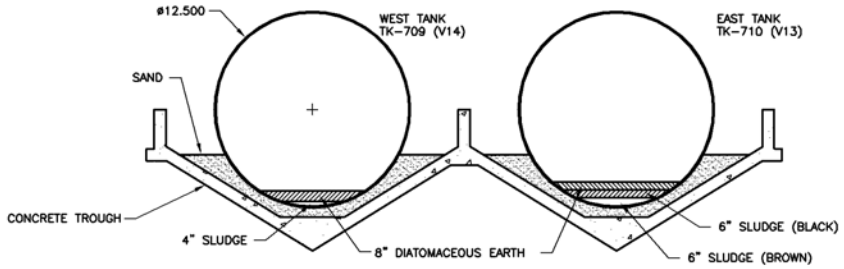


Figure 1-2. OU 1-10 Group 3 remedial action sites.



a. Elevation: Looking West at Tank 710



Note: The sludge layers were measured before the diatomaceous earth was deposited.

b. Section A–A: Looking North

Figure 1-3. PM-2A tanks configuration.

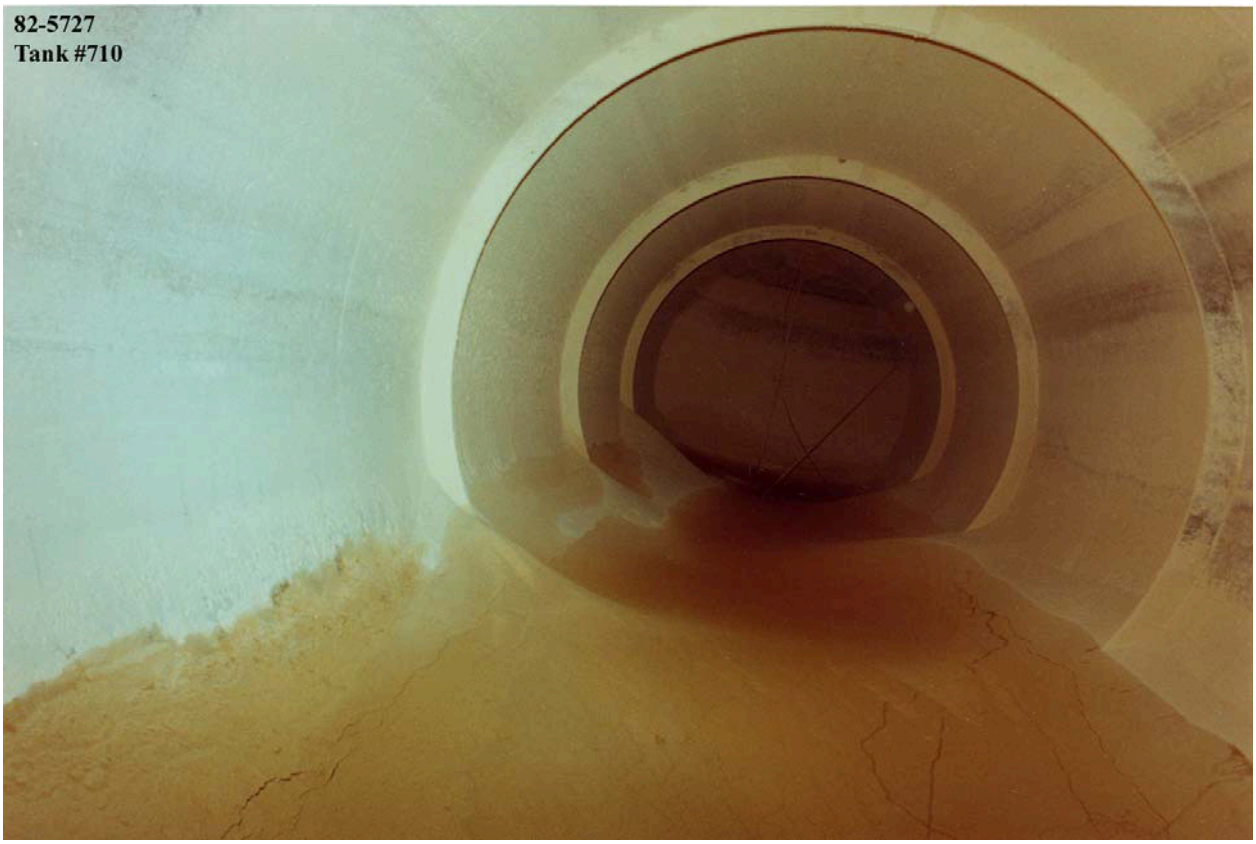


Figure 1-4. Photograph taken inside Tank V-13 (TK-710) in 1982 after the addition of diatomaceous earth.

1.3 Remediation Approach Overview

The original ROD-selected remedy for the PM-2A tanks was soil excavation, tank content vacuum removal, treatment and disposal of tank contents, tank decontamination, confirmation sampling, and excavation backfill and contouring. During development of the original RD/RAWP, deviations to the ROD-selected remedy were identified. More specifically, rather than decontaminating the tanks and leaving them in place, the tanks would be removed and disposed of at the ICDF. While this approach represented a deviation from the OU 1-10 ROD, it was consistent with the intent of the ROD and leaves the PM-2A tanks site in a state that is more protective of human health and the environment and is consistent with the HWMA/RCRA closure plan (DOE-ID 2004b).

The modified remedy for the PM-2A tanks is soil excavation; tank removal with the waste inventory in the tanks; waste treatment (as necessary); disposal of the tanks and waste inventory at the ICDF or another approved facility; confirmation sampling; and site backfill, recontouring, and revegetation. The remediation approach for this remedy is outlined as follows:

- Contaminated soil will be excavated and transported to ICDF for disposal (Group 1 soils were addressed in the Group 1 RD/RAWP)

- Tanks will be removed whole, with the waste inventory in the tanks, and moved to an established CERCLA storage area inside the TAN-607A High Bay (addressed in this RD/RAWP addendum)

- Tank system HWMA/RCRA closure activities will be performed per the HWMA/RCRA closure plan (DOE-ID 2004b) and associated field sampling plan (FSP) (DOE-ID 2004c) (addressed in this RD/RAWP addendum)

- Soil confirmation sampling will be performed to confirm surface soil above the designated final remediation goal (FRG) has been removed (addressed in this Group 1 RD/RAWP addendum)

- Soil confirmation sampling may be performed to determine the Cs-137 concentration remaining at the site post-remediation for the application of institutional controls (ICs)

- Tank contents may be treated (as necessary) within TAN using thermal desorption or chemical oxidation/reduction (to be addressed in RD/RAWP Addendum 2)

- Tank contents confirmation sampling will be performed to confirm the treated contents meet land disposal restrictions (LDRs) and the disposal facility's waste acceptance criteria (WAC) (to be addressed in RD/RAWP Addendum 2)

- The tanks and treated contents will be transported to the ICDF (or another approved facility) for disposal (to be addressed in RD/RAWP Addendum 2)

- The site will be backfilled and recontoured to match the surrounding grade (addressed in this RD/RAWP addendum)

- The site will be revegetated (addressed in this RD/RAWP addendum)

- Institutional controls will be reestablished based on the level of contamination that is remaining at the site (addressed in this RD/RAWP addendum).

2. DESIGN BASIS AND REQUIREMENTS

This section identifies the overall remedial action objectives (RAOs) including FRGs and HWMA/RCRA closure requirements. This section also identifies the design basis and requirements that must be addressed and incorporated into the TSF-26, PM-2A tanks remedial design and that must be met in implementing the remedial action.

2.1 Remedial Action Objectives

The RAOs for OU 1-10, as identified in the ROD, include those developed for the soil and those developed for the PM-2A tanks' contents.

The applicable RAO for the TSF-26 soil is:

- Reduce risk from external radiation exposure from Cs-137 to a total excess cancer risk of less than 1 in 10,000 for the hypothetical resident 100 years in the future and the current and future worker.

The RAO for the PM-2A tanks' contents is:

- Prevent release to the environment of the PM-2A tanks' contents.

To meet the RAO for soils a FRG is identified in the ROD. This RD/RAWP addendum addresses tank and waste inventory removal, placement of the tanks with waste inventory in the tanks in compliant CERCLA storage, contaminated soil removal and disposal, and site backfill and restoration. The design and remedial action described in the subsequent sections of this document will provide the basis for meeting the RAOs and FRGs identified above.

The ROD also requires that the tanks and associated piping be HWMA/RCRA closed. Specific HWMA/RCRA closure standards and requirements are provided in the HWMA/RCRA closure plan (DOE-ID 2004b) and associated FSP (DOE-ID 2004c), but are supported by the remedial design and remedial action activities in this document. Where the closure activities interface with the remedial action activities, they are noted in this document.

Further information on the FRGs and HWMA/RCRA closure requirements is provided in following subsections.

2.1.1 Final Remediation Goals

To meet these RAOs for surface soils, FRGs were established and documented in the ROD (DOE-ID 1999) to ensure a risk-based protectiveness of human health and the environment by providing unrestricted land use in 100 years. These goals, which are both contaminant- and site-specific, are quantitative cleanup levels based primarily on ARARs and risk-based doses. The soil FRG for TSF-26, as identified in Table 6-1 of the ROD, is:

- 23.3 pCi/g Cs-137.

The ESD section of the February 2004 ROD amendment (DOE-ID 2004a) provided clarification on how the FRG applies to the soil remediation based on depth bgs.

- From ground surface to 10 ft bgs, soil exceeding the Cs-137 FRG of 23.3 pCi/g will be excavated and disposed

- From 10 ft bgs and deeper, soil will only be removed as necessary to support tank and piping removal.

2.1.2 HWMA/RCRA Closure

The OU 1-10 ROD also specifies that the TSF-26, PM-2A tanks are subject to closure under the State of Idaho HWMA/RCRA. To address this requirement, a separate HWMA/RCRA closure plan (DOE-ID 2004b) has been prepared that specifies activities necessary to meet the closure performance standards for "clean closing" the PM-2A tank system. The activities necessary to comply with the HWMA/RCRA closure performance criteria are:

- The tanks with the waste inventory in the tanks will be excavated and transferred to a CERCLA storage area for treatment, as necessary, and subsequent disposal

- Ancillary equipment will be removed and disposed

- Concentrate piping to the PM-2A tanks will be verified empty and piping integrity evaluated. (Alternatively, if the system piping is not verified empty or integrity cannot be verified the piping will be removed and the associated soils sampled in accordance with the associated FSP.)

2.2 ROD Remedy Implementation Approach and Performance Criteria

Table 2-1 describes the ROD remedy elements, as specified in the OU 1-10 ROD (DOE-ID 1999) and ROD amendment and ESD for the PM-2A tanks (DOE-ID 2004a), and associated implementation criteria and the approach for satisfying those criteria.

Table 2-1. TSF-26, PM-2A tanks remedy implementation approach and performance criteria.

ROD Remedy Element	Implementation Approach	Performance Criteria
1) Sampling was performed and a NLCID was developed under the Group 1 RD/RAWP for soil that was excavated and disposed of at RWMC in 2000.	• The majority of surface soils are addressed in the Group 1 RD/RAWP. Sampling was performed and an NLCID was prepared for soils that were disposed at RWMC. A NLCID is not required for soil disposed at ICDF. • For remaining surface soils (soils from 0–10 ft bgs) over the top of the tanks, a NLCID is not required since soil will also be disposed at ICDF.	• A NLCID was developed based on sampling conducted as part of the original RD/RAWP completed as stated.
2) Excavating contaminated soil • Excavating contaminated soil exceeding the FRG to a maximum of 3 m (10 ft) bgs. • Excavating additional soil exceeding the FRG below 3 m (10 ft) bgs to the extent necessary to remove the PM-2A tanks and associated piping.	• Soil from 0–10 ft bgs that exceeds the FRG of 23.3 pCi/g will be excavated and disposed at ICDF. • Soil that is more than 10 ft bgs will be removed as necessary to support the tank and piping removal Excavated soil will be disposed at ICDF.	• Confirmation sampling will be performed under the Group 1 RD/RAWP to confirm contaminated surface soils exceeding 23.3 pCi/g have been removed (see Item 9). Sampling confirms contamination is less than 23.3 pCi/g. • Confirmation sampling will be performed to determine the timeframe needed for ICs (see Item 9). Sampling determines the concentration of Cs-137 (in pCi/g) for the soil located more than 10 ft bgs.
3) Disposing the contaminated soil at an acceptable soil repository.	• Contaminated soil will be disposed of at ICDF.	• ICDF verification sampling shows that soils can be transported to ICDF for disposal.
4) Sampling tank contents.	• Tank contents will be sampled and analyzed for radiological and hazardous contaminants.	• Tank contents were sampled and analyzed in 2003 in accordance with the FSP for the TSF-26, PM-2A tank contents (INEEL 2003). Sampling is completed.
5) Tanks will be removed with the waste inventory in the tanks.	• Each tank will be excavated and removed with the waste inventory in the tanks.	• Completed as stated.

Table 2-1. (continued).

ROD Remedy Element	Implementation Approach	Performance Criteria
6) The waste in the tanks will be treated as necessary to meet LDRs and disposal facility WAC. Confirmation sampling will be conducted to verify that no further treatment is necessary prior to disposal.	• The waste in each tank will be treated, as necessary. Treatment options include thermal desorption or chemical oxidation/reduction. Confirmation sampling will be performed following treatment to ensure the contents meet LDRs and the ICDF WAC. ***Note:*** *This element will be addressed in RD/RAWP Addendum 2.*	• Confirmation sampling confirms treated waste meets disposal criteria.
7) Disposing the tank contents and investigation-derived waste at an acceptable repository (or other approved facility, if necessary)	• The treated tank contents and tanks will be disposed of at the ICDF. ***Note:*** *This element will be addressed in RD/RAWP Addendum 2.*	• Implemented as stated. No quantitative performance criteria are appropriate for this element.
8) There is no need to decontaminate the tanks since they will no longer be left in place but disposed of at the ICDF or other approved facility. Before disposal, the waste inventory will be treated, as necessary, to meet LDRs and disposal facility WAC. If the tanks are disposed of whole, void space in the tanks will be filled, as necessary or desirable, as part of disposal facility operations.	• See Items 6 and 7 above. The interior of the tanks will not be decontaminated prior to movement to the TAN-607A High Bay and treatment of the waste (if necessary). Void space in the tanks will be filled at the ICDF, if necessary, as part of the process to place the tank in the ICDF disposal cell.	• Implemented as stated. No quantitative performance criteria are appropriate for this element.
9) Post-remediation soil sampling to verify FRGs are met and to analyze for additional contaminants if excavation indicates a release of the PM-2A tanks' contents waste. Clarified as follows:	• Soil confirmation sampling will be performed as follows: a) For soil less than 3 m (10ft) bgs, confirmation sampling will be performed at the bottom of the excavation.	• Sampling is completed as stated and is used to meet the following: a) Sampling results confirm soil is less than 23.3 pCi/g for Cs-137. b) Sampling results identify soil concentrations for Cs-137 in pCi/g to determine the need and time period for ICs.

Table 2-1. (continued).

ROD Remedy Element	Implementation Approach	Performance Criteria
a) For contaminated soil less than 3 m (10 ft) bgs, post-remediation sampling to verify Cs-137 FRG is met. b) For contaminated soil more than 3 m (10 ft) bgs, post-remediation sampling to determine need for ICs. c) For contaminated soil beneath the PM-2A tanks and piping, where there is evidence of a release (leak from tank or piping), post-remediation soil sampling at the bottom of the excavation, to analyze for PM-2A tanks contaminants to support a risk analysis that supports a potential revision to the FRGs and a determination of the need for further actions. This determination could lead to application of ICs, further remediation, or no action. d) For contaminated soil beneath the PM-2A tanks and piping, where there is no evidence of a release from tank or associated piping, post remediation soil sampling to determine the appropriate ICs, if any, for this site.	b) For soil more than 3 m (10 ft) bgs, that is not beneath the PM-2A tank system tanks or piping, sampling will be performed within the excavation to determine the need and time for ICs. c) If there is evidence of a release: ▪ For a release under piping, biased soil sampling will be performed per the HWMA/RCRA closure plan (DOE-ID 2004b) and contingent FSP (ICP 2004); the contaminated soil removed; additional samples collected, as appropriate; and a risk assessment performed to determine if new FRGs are required. ▪ For a release under the tanks, the sand pad and concrete cradles will be removed; biased soil sampling will be performed per the HWMA/RCRA closure plan and contingent FSP; and a risk assessment performed to determine if new FRGs are required. ▪ Based on the risk assessments performed, additional actions (ICs, further remediation, or no action) will be determined.	c) Sampling is completed per the HWMA/RCRA closure plan and contingent FSP. A risk assessment is performed to determine if new FRGs are required A determination is made on what further action (ICs, further remediation, or no action), if any, is required. d) For soil less than 3 m (10 ft) bgs, sampling results confirm soil is less than 23.3 pCi/g for Cs-137. For soil more than 10 ft bgs, sampling results identify the soil concentration for Cs-137 in pCi/g to determine the need and time period for ICs. ***Note:*** *Performance criteria will be identified in RD/RAWP Addendum 2.*

Table 2-1. (continued).

ROD Remedy Element	Implementation Approach	Performance Criteria
	d) For soil less than 3 m (10 ft) bgs, confirmation sampling will be performed at the bottom of the excavation. For soil more than 10 ft bgs, sampling will be performed within the excavation to determine the need and time for ICs.	
10) Filling the excavated area with clean soil, then contouring and grading to surrounding soil.	• The excavated area will be backfilled with clean soil. • The site will be finish graded and contoured to match the surrounding surfaces. • After finish grading the site will be revegetated.	• Site remediation activities are completed as stated.
11) Institutional controls will be required if contamination precludes unrestricted land use after completion of remedial action.	• If contamination is left at the site above 2.3 pCi/g, ICs will be reestablished.	• Site is adequately characterized and ICs are in place.
12) PM-2A tanks are subject to closure under the State of Idaho HWMA.	• Incorporate HWMA/RCRA closure requirements into Phase 1 remedial actions.	• Closure activities are complete and certified by an independent registered professional engineer.

2.3 General Requirements

The following subsections summarize the general project requirements, regulatory requirements, and design criteria that are applicable to Phase 1 activities – tank removal and site remediation.

2.3.1 Regulatory Requirements

Under CERCLA Section 121 (42 USC 9601 et seq., 1980) and the National Oil and Hazardous Substances Pollution Contingency Plan (55 Federal Register 46, 1990), the Agencies must select remedies that are protective of human health and the environment, that comply with all ARARs, that are cost-effective, and that utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ, as a principal element, treatment that permanently and significantly reduces the toxicity, mobility, or volume of hazardous wastes, and has a bias against off-Site disposal of untreated wastes. Implementation of the ROD-selected remedies for the PM-2A tanks will comply with all ARARs for the PM-2A tanks site. Appendix A, Table A-1, summarizes the ARARs for the PM-2A tanks site, and includes strategies for ensuring that the ARARs are met.

2.3.2 Department of Energy Orders and Standards

The following DOE orders and standards apply to the design and implementation of the PM-2A tanks remediation:

- DOE Order 231.1, "Environment, Safety, and Health Reporting"
- DOE Order 414.1A, "Quality Assurance"
- DOE Order 435.1, "Radioactive Waste"
- DOE Order 470.1, "Safeguards and Security Program"
- DOE Order 5400.5, "Radiation Protection of the Public and Environment"
- DOE Order 5480.4, "Environmental Protection, Safety, and Health Protection Standards."

2.3.3 INEEL Requirements

The following documents provide key INEEL project-specific requirements that apply to the design and implementation of the PM-2A tanks remediation:

- *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory*, Administrative Record No. 1088-06-29-120, Department of Energy Idaho Operations Office; Environmental Protection Agency, Region 10; State of Idaho, Department of Health and Welfare, December 9, 1991 (DOE-ID 1991).
- *Remedial Design and Remedial Action Guidance for the Idaho National Engineering Laboratory*, DOE/ID-12584-152, Rev. 2, 1993 (DOE-ID 1993).
- *Final Record of Decision for Test Area North, Operable Unit 1-10*, DOE/ID-10682, Rev. 0 (DOE-ID 1999).

- *Record of Decision Amendment for the V-Tanks (TSF-09 and TSF-18) and Explanation of Significant Differences for the PM-2A tanks (TSF-26) and TSF-06, Area 10, at Test Area North, Operable Unit 1-10 at the Idaho National Engineering and Environmental Laboratory, Idaho Falls, Idaho*, DOE/ID-10682 Amendment, Rev. 0, February 2004 (DOE-ID 2004a).

- *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Deactivation, Decontamination, and Decommissioning*, DOE/ID-10587, Rev. 8, March 24 2004 (DOE-ID 2004d).

- *Hazardous Waste Management Act/Resource Conservation and Recovery Act Closure Plan for the Test Area North/Technical Support Facility Intermediate-Level Radioactive Waste Management System, Phase III: Intermediate Level Radioactive Waste Holding Tank Subsystem (PM-2A Tanks)*, DOE/ID-11076, Rev. 3, February 2004 (DOE-ID 2004b).

- *Idaho National Engineering Laboratory Waste Acceptance Criteria*, DOE/ID-01-10381, Rev. 19, April 2004 (DOE-ID 2004e).

- *ICDF Complex Waste Acceptance Criteria*, DOE/ID-10881, Rev. 1, July 2003 (DOE-ID 2003b).

- *Waste Acceptance Criteria for the ICDF Landfill*, DOE/ID-10865, Rev. 6, April 2004 (DOE-ID 2004f).

- "Hoisting and Rigging," DOE-STD-1090-2001, April 2001.

- *Operating Plan for the Test Area North Demolition Landfill at the Idaho National Engineering and Environmental Laboratory*, INEEL/EXT-03-00714, Revision 1, March 2004 (INEEL 2004c).

2.3.4 Reference Documents

The following documents are key reference documents for this RD/RAWP addendum under which activities will be completed:

- *INEEL Sitewide Institutional Controls Plan for CERCLA Response Actions,* DOE/ID-11042, April 2003 (DOE-ID 2003c).

- *Operations and Maintenance Plan for Test Area North, Operable Unit 1-10*, DOE/ID-10711, Rev. 1, 2001 (DOE-ID 2001).

2.4 Design Criteria

Based on the general project requirements, regulatory requirements, and TFRs, project-specific design criteria have been developed and provide the basis for the remedial design. The design criteria include selected general TFRs for the PM-2A tanks remediation project as identified in TFR-234, "Technical and Functional Requirements for the Remediation of PM-2A Tanks, TSF-26, Operable Unit 1-10."

2.4.1 General Requirements

The applicable design inputs and performance requirements are based on the regulatory requirements, codes, and standards identified and documented in the OU 1-10 ROD (DOE-ID 1999). These requirements are listed as ARARs for the remedial activities. Appendix A provides ARAR

applicability tables for the remedial actions. These tables identify the ARARs listed in the ROD and present a brief description of how each of the ARARs will be implemented during the remediation activities.

The following list is a summary of the general design requirements, based on the ARARs, which are applicable for all the activities associated with this addendum:

- Mitigate the release of contaminants during soil excavation, tank content removal, tank removal, and waste packaging and disposal activities.
- All hazardous waste streams generated during remediation activities that will be stored and/or disposed of must have a HWD developed.
- All wastes generated will be processed and handled using the Waste Generator Services (WGS) organization.
- All hazardous and mixed low level wastes will be processed, packaged, and transported, through WGS and Packaging and Transportation (P&T), in accordance with the ICDF WAC. Other wastes will be disposed of through WGS in accordance with INEEL WAC and may be disposed of at the INEEL landfill at the Central Facilities Area, the TAN demolition landfill, or at the RWMC.
- All waste generated during remediation operations will be managed in accordance with the project-specific waste management plan (WMP) (INEEL 2004a).
- Work activities and site access restrictions will be controlled by INEEL work control processes and will be performed in accordance with this RD/RAWP addendum.
- All personnel involved in soil excavation, tank content removal, and tank removal will be trained in accordance with the requirements listed in the project-specific health and safety plan (HASP) (INEEL 2004d).
- Contingency plans and emergency equipment will be identified, tested, and maintained.
- Equipment decontamination will be conducted in accordance with the project decontamination plan (INEEL 2004b).
- Remediation wastes will be kept in compatible containers meeting the requirements of 40 Code of Federal Regulations (CFR) 264 (2003).
- Existing ICs will continue following completion of the remedial actions as specified in the OU 1-10 IC plan (INEEL 2000).
- Operational and decontamination sampling will be performed in accordance with project sampling plans.
- The tanks will be placed in a storage area meeting the substantive secondary containment requirements of 40 CFR 264 (2003).

2.4.2 Phase 1-Specific Requirements

In addition to the general design requirements, a separate INEEL TFR document was developed for the Phase 1 PM-2A tanks remedial actions. The following list summarizes the requirements specific to the Phase 1 remedial action:

- The lifting device(s) shall have sufficient capacity to lift the heaviest tank (V-13), weighing a maximum of 58 tons (sludge mixture included), and the additional weight of the increased loading of surface tension between the tank and the sand when the tank is being removed.

Note: *Due to the uneven distribution of sludge/DE mixture within the tanks the center of gravity may be slightly off-center. The lifting devices should consider this in the design.*

- All lifting devices shall be designed and load tested in accordance with the DOE Standard DOE-STD-1090-2001, "Hoisting and Rigging," Chapter 14, Below the Hook Lifting Devices.

- The lifting device(s) shall interface with the TAN 607A 75-ton crane hook, if deemed necessary.

- The placement of the crane(s) shall adhere to the spatial constraints presented by the PM-2A tanks area, and will be stationed at the existing ground level on the outskirts of the PM-2A tanks pit.

- The crane shall have sufficient reach to lift the farthest tank. The actual crane distance shall be based on the proposed lifting configuration.

- The transporters shall be capable of harnessing a single tank in the horizontal position.

- The transporters shall interface with the support cradles used for transport and storage.

- The transporters shall have sufficient capacity to accommodate the heaviest tank (V-13), weighing a maximum of 58 tons (sludge included), plus the additional weight of grout (98,296 lb) that may be added to the tanks for sludge treatment, plus the weight of the transport/storage cradle.

Note: *INEEL TFR required the design of the tank cradles and associated design components (e.g., TAN-607A High Bay floor loading and transport configuration) be designed to accommodate the potential addition of grout during Phase 2 treatment. Specific treatment technologies will be addressed during Phase 2 remedial actions and will be documented in Addendum 2 to the Group 3 RD/RAWP.*

- Support cradles and restraining devices shall be designed to interface with the transporter(s) used to transport the tank from the site to TAN-607A. The tanks shall lie horizontally on the cradles and transporters.

- The support cradles shall be designed to provide as much open surface area as possible on the bottom of the tanks to accommodate waste treatment activities to be conducted during Phase 2 remedial actions.

- The support cradles shall have sufficient capacity to harness the heaviest tank (V-13), weighing a maximum of 58 tons (sludge included), plus the additional weight of grout (98,296 lb) that may be added to the tanks for sludge treatment during Phase 2 remedial actions.

Note: *INEEL TFR required the design of the tank cradles and associated design components (e.g., TAN-607A High Bay floor loading and transport configuration) be designed to accommodate the potential addition of grout during Phase 2 treatment. Specific treatment technologies will be addressed during Phase 2 remedial actions and will be documented in Addendum 2 to the Group 3 RD/RAWP.*

- If determined practical, the support cradles shall have a modular design with attached axles. If a modular design is used the cradles may need to meet applicable Department of Transportation (DOT) requirements necessary for future movement of the tanks to the ICDF.

2.4.3 Site Remediation Requirements

Upon completion of all earthwork activities, reclamation seeding will take place on the backfilled excavations, lay down areas, and on all areas affected by material borrowing, stockpiling, etc. Some areas (e.g., staging or lay down areas) may be used for roads and parking. The seeding and mulching will be performed in accordance with this plan. Requirements for subsequent inspection to confirm that revegetation has been successful will be addressed in the next revision of the *Operations and Maintenance Plan for the Test Area North, Operable Unit 1-10* (DOE-ID 2001).

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3. UNCERTAINTY MANAGEMENT

During the remedial design, uncertainties and project risks have been identified with respect to various aspects of the remedial action. To the extent possible, these uncertainties and project risks have been reduced or mitigated through the development of the design. Table 3-1 lists the uncertainties and project risks identified for these activities and specifies the actions designed to manage the project risk prior to or during remediation.

Table 3-1. Identification and mitigation of remedial action uncertainties.

Uncertainty	Risk	Mitigation Action
Radiation levels in the soil around the tanks might be higher than expected and require a significant quantity of soil to be removed and disposed of.	The designed storage capacity and transportation capabilities are exceeded for the project.	Only soil above the soil FRG of 23.3 pCi/g for Cs-137 is targeted for removal. Separate activities will be performed prior to the start of these activities to remove all identified surface soils above the FRG.
Radiation fields in the working area(s) near the tanks might be higher than expected.	Work controls established for project activities are not protective of the workers.	Radiation fields are predicted prior to starting fieldwork based on available radiological date to establish work controls. The tanks will be excavated early such that real radiological doses can be measured and radiation work controls can be adjusted as necessary. Real-time analyses will be conducted during remediation activities and work controls adjusted as necessary.
The contaminant concentrations in the soil below the tanks and around the concrete cradles might not meet CERCLA FRGs.	Additional soil and possibly the concrete cradles would have to be removed, packaged, and dispositioned.	Samples collected from within the cradles in 2003 are currently being analyzed and will provide information to make decisions regarding the extent of excavation required and other potential remediation activities under CERCLA. Data (e.g., visible soil staining, visual inspection of the tank exterior, and soil radiological readings) will be used to provide information during remedial actions to determine whether additional remedial actions for the sand pads and associated concrete cradles are required. Contingent planning may be conducted to address sand pad and cradle removal, if determined necessary per requirements established in HWMA/RCRA closure plan (DOE-ID 2004b).
Corrosion of the tank wall may result in tank failure during lifting	Tank contents would be released to cradles/surrounding soils/sand, creating potential airborne contamination and additional contaminated soil/sand.	Structural integrity of the tanks will be calculated and documented. Tank thickness measurements (nondestructive examination/ ultrasonic examination [NDE/UT]) will be performed following the tank excavation. Minimum necessary thickness of the tanks will be determined based on lifting design. Tanks will not be lifted if the tank thickness (based on NDE/UT) does not meet or exceed the minimum determined thickness for the lift.

Table 3-1. (continued).

Uncertainty	Risk	Mitigation Action
Tanks do not have sufficient structural integrity to complete the lift	Remediation activities cannot be completed as planned	Finite element analysis calculations for the lifting design are being completed to determine the minimum tank thickness necessary to safely complete the lift. This thickness will be compared to that measured using NDE/UT and corrosion estimates, such that a final determination can be made as to whether to complete the lift. Based on this determination, additional measures may be taken to further evaluate existing tank conditions, modify the lift approach, or revise the remediation approach for the PM-2A tanks.

4. REMEDIAL DESIGN

This section presents the design for Phase 1 of the PM-2A tanks remediation. The remedial design includes an overview with identification of analysis performed, design assumptions, and detailed design description. Design SPCs and drawings are identified and are included as attachments to this RD/RAWP addendum. For some portions of the design, more detailed design drawings and SPCs may be prepared to support material and equipment fabrication/procurement and/or fieldwork implementation.

4.1 Design Overview

The applicable design inputs and performance requirements are based on the regulatory requirements, codes, and standards identified and documented in the OU 1-10 ROD (DOE-ID 1999). These requirements are listed as ARARs for the remedial activities. Appendix A provides ARAR applicability tables for the remedial actions. These tables identify the ARARs listed in the ROD and present a brief description of how each of the ARARs will be implemented during the remediation activities. Design requirements are summarized in Section 2. The design for Phase 1 PM-2A tanks removal and site remediation includes the following elements:

- Site Preparation and Mobilization—Site preparation and mobilization activities include completion of surface soil removal activities and staged mobilization throughout the remedial action to support activities being performed. Site preparation activities also include partial piping removal being performed under the original Group 3 RD/RAWP, Drawing C-2 (DOE-ID 2003a). Piping inspection/integrity evaluation (or soil sampling under the piping) will be performed as required by Sections 4.1.2 and 4.1.3 of the HWMA/RCRA closure plan (DOE-ID 2004b).

- Excavation for Tank Removal—Tank excavation activities include excavation of the tank site such that the tanks can be accessed, necessary lifting devices attached, and tank wall thickness evaluated in preparation for lifting. Tank excavation activities also include partial removal of the sand pad material to minimize the surface tension between the sand pads and the tanks during lifting. During tank excavation, the necessary crane pad, access pathways, and transport pathways will be constructed to support the tank lift. After tank excavation the remaining feed piping will be removed to an interface point on the north side of Snake Avenue. Piping inspection/integrity evaluation (or soil sampling under the piping) will be performed as required by Sections 4.1.2 and 4.1.3 of the HWMA/RCRA closure plan (DOE-ID 2004b).

- TAN-607A High Bay Preparations—Prior to removal of the tanks from the site, the TAN-607A High Bay will be prepared to receive the tanks. Preparation activities include installation of steel beams to distribute the imposed loads, preparation of secondary containment, installation of radiation shielding, installation of cribbing and jack stands for placement of the tanks, and other activities necessary to allow the tanks to be placed in the building.

- Tank Lifting—The tanks will be lifted from the site with the waste inventory in the tanks and placed on support cradles for transport to the TAN-607A High Bay. Lifting devices necessary to complete the lift include lift beams, shackles, lifting points/devices, and the crane. Prior to placing the tanks into the cradles, an integrity evaluation will be performed as required by Section 4.1.3 of the HWMA/RCRA closure plan (DOE-ID 2004b).

- Tank Transport and Placement in the TAN-607A High Bay—Following placement of the tanks on the transporters, the tanks will be transported to the TAN-607A High Bay and placed for interim storage. Items necessary to complete the transport of the tanks include the transportation tie-downs, tank wrapping material, and the transporter itself.

- CERCLA Confirmation Sampling—Following tank removal, soils within the excavation >10 ft bgs will be sampled to determine the need for ICs.

- Excavation Backfill and Recontouring—Upon completion of tank removal activities and collection of CERCLA confirmation samples, the tank excavation will be backfilled and the site recontoured to match the surrounding grade.

- Revegetation—Following excavation backfill and recontouring, the TSF-26 site will be revegetated.

- Institutional Controls—The final remedial action activity associated with Phase 1 is the application of ICs based on contamination levels remaining >10 ft bgs.

4.2 Design Assumptions

Based on the work scope, available data and project documents, several assumptions are made regarding the design of the first phase of the remedy for the PM-2A tanks. The design will proceed based on these assumptions until additional information or sampling data are made available to better define the assumptions.

The design assumptions for the PM-2A tanks are as follows:

- The tanks have not leaked prior to this remedial action; therefore, the sand and cradles beneath the tanks are not contaminated and will not be removed

- Radiation fields can be controlled through the use of radiological shielding such that personnel access in the tank vicinity will be allowed for activities such as sand pad removal and welding lifting pads on the tanks

- The tanks have sufficient integrity to be lifted and transported.

- The cumulate effect of surface spills associated with the PM-2A evaporator did not result in contamination of the tank sand pads or concrete cradles.

4.3 Detailed Design Description

This section provides a detailed description of the design elements supporting each of the design activities identified in Section 4.1. The design elements included in this RD/RAWP include those elements essential to the successful completion of this project in compliance with the ROD requirements and identified ARARs. Supporting calculations and design analyses are included in Appendix C. Drawings and design SPCs are included in Attachments 1 and 2, respectively.

4.3.1 Site Preparation and Mobilization

Surface soil remediation activities will be completed under the original Group 1 RD/RAWP (DOE-ID 2003a) (Drawings C-1 and C-2; Attachment 1). Based on sampling conducted in 2003, an additional 2 ft of soil will be removed from the site prior to initiation of Phase 1 remedial actions (Hain 2003). Feed piping and other ancillary piping within the tank excavation (see Section 4.3.2) will be drained (if liquids present), cut, capped, and removed from the site. Any waste generated will be managed in accordance with the WMP (INEEL 2004a); treatment of wastes removed from the feed piping will be addressed in Addendum 2 to the Group 3 RD/RAWP. Following removal of waste from the piping, the piping will be managed as debris and sent to the ICDF for disposal. Because the integrity of the piping will not be verified, sampling beneath the feed piping, as required by the HWMA/RCRA closure plan (DOE-ID 2004b), will be conducted concurrently with piping removal activities. Following initial site preparation activities, equipment and personnel required to support the remedial actions identified below will be mobilized throughout the remainder of the field activities, as required.

4.3.2 Excavation for Tank Removal

Excavation activities will consist of excavating the tanks to a depth 1 ft below the tops of the concrete cradles such that the tops of the tanks are fully exposed to allow for attachment of lifting devices. The east, south, and west slopes of the excavation will be sloped at a slope of 1.5:1; the north slope of the excavation will be sloped at 1:1 as supported by slope stability analyses (PEI-EDF-1000; Appendix C). Excavation activities will be conducted using standard earthwork equipment and will be conducted in such a way that the structural integrity of the PM-2A tanks is not compromised.

Following soil removal to the tops of the tank cradles, the remaining soil/sand pad will be removed from the sides and ends of the tank using a vacuum soil excavator or other appropriate excavation methods. Controls will be in place to minimize the release of airborne radioactive contamination. As much sand as technically practical will be removed, such that the entire sand pad is removed except approximately the bottom 90 degrees of the tank surface (45 degrees on each side from tank centerline) (Drawing P-FFA/CO-PM2A-006; Attachment 1). Removal of the sand is necessary to minimize the "suction" force imposed on the tanks by the sand when being lifted. During sand pad removal activities, data will be collected to determine whether there is evidence of a release from the tank. Data points may include visual inspection of the sand for staining, radiological surveys of the sand following removal (i.e., surveys of the surface of waste boxes), and other radiological samples, as determined practical.

Prior to tank lifting and following tank excavation activities, the necessary improvements to the site to support the lift will be prepared. These preparations include construction of an access pathway, the crane pad, and a transfer road. Fill materials for the construction of the access paths and transfer road will be placed in loose lifts not exceeding 6 in. in thickness, uniformly moisture-conditioned, and compacted to a minimum of 90% of maximum dry density per ASTM D 698, within 2% of optimum moisture content. Road and crane access path (as shown on Drawing No. P-FFA/CO-PM2A-001 [Attachment 1]) shall be level. The crane access ramp shall be sloped no steeper than 5:1. The transporter access ramp shall be sloped no steeper than 12:1. The crane pad shall be constructed by placing fill materials in loose lifts not exceeding 6 in. in thickness, uniformly moisture conditioning and compacting to a minimum of 95% of maximum dry density per ASTM D 698, within 2% of optimum moisture content. The crane pad shall be level within one-half of a degree in any direction.

Six inches of clean fill will be spread over the entire surface of the TSF-26 site (excluding the tank excavation) to minimize the potential for the spread of contamination. Additionally, a fixative may be sprayed on the slopes of the excavation to minimize the potential for windblown spread of contamination to the crane or other support equipment.

Immediately following or prior to tank excavation the PM-2A tanks will be inspected to determine tank wall thickness in critical locations (locations of lifting pads, sludge/air interface where the greatest corrosion of the tank wall would be expected, and other areas where, based on observations during tank excavation or sand pad removal, integrity of the tanks may be in question). Tank thickness measurements (nondestructive examination/ultrasonic examination [NDE/UT]) will be collected to compare with complete corrosion calculations. The resulting data will be compared to the design criteria SPCs for minimum wall thickness necessary to safely perform the planned lift, thus providing an assurance that a catastrophic failure of the tanks during the lift will not occur.

After tank excavation, the remaining feed piping will be removed to the system boundary (existing caps) on the north side of Snake Avenue. The piping will be drained (if liquids present), cut, capped, and removed from the site. Any waste generated will be managed in accordance with the WMP (INEEL 2004a); treatment of wastes removed from the feed piping will be addressed in Addendum 2 to the Group 3 RD/RAWP. Following removal of waste from the piping, the piping will be managed as debris and sent to the ICDF for disposal. Because the integrity of the piping will not be verified, sampling beneath the feed piping, as required by the HWMA/RCRA closure plan (DOE-ID 2004b), will be conducted concurrently with piping removal activities.

4.3.3 TAN-607A High Bay Preparations

Prior to removal of the tanks from the site, the TAN-607A High Bay will be prepared to receive the tanks. Preparation activities include installation of a secondary containment system, installation of steel planks to distribute the imposed loads, installation of radiation shielding, installation of cribbing and jack stands for placement of the tanks, and other activities necessary to allow the tanks to be placed in the building (Drawing P-FFA/CO-PM2A-004; Attachment 1).

Structural engineering calculations have been performed to determine the load-bearing capacity of the TAN-607A High Bay floor (PEI-EDF-1007; Appendix C). Based on these analyses, the highest floor-loading capacity is down the center of the High Bay where the railroad tracks lie. However, a 4-ft-wide, 57-ft-6-in.-long assembly pit is located between the two sets of railroad tracks. The load-bearing capacity of this section of the TAN-607A High Bay is significantly less (285 lb/ft^2) than that of the surrounding area (2,615 lb/ft^2). Steel planks that are 2 by 8 by 0.188 in., and 20 ft in length will be used to distribute the loads that will be imposed on the floor during storage and post-treatment. The steel planks will be placed the length of the assembly pit and are sized such that they will accommodate the tank cribbing and distribute the load. Tank storage configuration drawings are included in Attachment 1.

As the tanks will be moved to the TAN-607A High Bay for storage until Phase 2 remedial actions, the tank storage area will be configured such that it meets the substantive requirements for HWMA/RCRA tank systems (40 CFR 264, 2003). The secondary containment system (PEI-EDF-1004; Appendix C) will utilize the shielding wall described below for structural support. The blocks are of an interlocking design where the ends fit into adjacent blocks. The perimeter of the wall will be 120 ft 10 in. in length, 26 ft 8 in. in width, and 9 ft 0 in. in height. The secondary containment system will be prepared in such a manner that three sides will be in place prior to the placement of the tanks. The floor area enclosed by the concrete walls will be covered with a 30-mil liner that is compatible with the waste. The liner material will be turned up the inside of the wall to provide a freeboard height of at least 12 in., providing containment for approximately 21,500 gal of liquid volume. The estimated volume of the heels contained in both tanks is approximately 7,000–10,000 gal. The free liquid volume is significantly less but has not been quantified. The secondary containment will not contain 100% of the volume of the largest tank; however, it will contain in excess of 200% of the estimated volume of the semi-solid heels in both tanks. A remote closed-circuit television monitoring system will be installed at opposite corners of the secondary containment system. This camera system will be used to perform inspection and will also

serve as a leak detector while the tanks are staged in the High Bay. This system will allow the remote monitoring of the CERCLA storage area. The closed-circuit television system will have the capabilities of zoom, pan, and tilt in order to provide a full remote inspection of the enclosed area. The lighting in the area will be supplemented, as necessary, to perform inspections. Additional cameras may be installed, as required, should they be needed to provide more complete inspections of the storage area. As a means of removing any accumulated liquids from the containment area, a high-efficiency particulate air filtered wet/dry vacuum cleaner will be available nearby.

Temporary concrete shielding will be placed around the PM-2A tanks while stored in the TAN-607A High Bay to keep personnel exposure rates below 0.5 mR/hr for general occupancy of the area (PEI-EDF-1005; Appendix C). The shielding will extend completely around the tanks to a height of approximately 9 ft above floor level. Shielding requirements were based on MicroShield modeling results (MicroShield 2003). Upon excavation of the tanks real-time radiological measurements will be obtained and the shielding design adjusted, as necessary.

The tank cradle system design for each tank consists of two saddles resting on a support beam extension (Drawing C-067-RP0003-005; Attachment 1). The saddles will be located between the outer set of tank stiffener rings at each end of the tank (approximately 25-ft centerline saddle to saddle and 15 ft from either end of the tank). For placement in the TAN-607A High Bay the saddle support beam will be lowered to rest upon jack stands that are positioned upon matting to further distribute the imposed load (Drawing C-067-RP0003-002; Attachment 1).

The TAN-607A High Bay will be established as a CERCLA storage area and will be configured and operated in accordance with all applicable requirements.

4.3.4 Tank Lifting

A Manitowoc Model 2250 crane with MAX-ER 2000 will be used to lift the tanks. The size of the crane is necessitated by the weight of the tanks and the distance between the crane and the load necessitated by excavation sloping and crane setback (Drawing P-FFA/CO-PM2A-008; Attachment 1). Eight 20- by 20-in. lifting pads will be welded to each tank, with four lifting pads located on each side of the tank at each of the stiffener rings, 45 degrees from the tank top centerline. The lifting pads, which will be pre-equipped with lifting lugs, will be welded to the tanks using a full-length 1/4-in. fillet weld.

The tanks will be lifted using three spreader beams (Mobile Crane Lift Plan; Appendix C). A 100-ton, 22-ft spreader bar will be located directly beneath the hook of the crane. Two 16-ft, 6-in. spreader bars will be located beneath the 22-ft spreader bar. The 16-ft spreader bars will be shackled to the lifting pads that are welded to the tanks. All below-the-hook lifting devices will be load tested prior to mobilization to the site. This lifting configuration allows for adjustments in the choker lengths to accommodate uneven distribution of the sludge within the tanks.

As the tanks are lifted from the cradles, residual soil/sand on the tanks will be removed using appropriate decontamination methods as described in the decontamination plan (INEEL 2004b). Removal of residual soil/sand will be conducted to minimize the potential spread of contamination.

Two lifting options were initially evaluated: lifting from the top or slinging the tanks and picking from the bottom. Because of uncertainties associated with fishing the slings beneath the tanks and as low as reasonably achievable (ALARA) issues associated with personnel completing this activity, it was determined that lifting from the top was the preferred approach. Finite element analysis calculations have been completed to determine the necessary thickness required to safely lift the tanks (Calculations No. ST-468; Appendix C). This thickness will be compared to that measured using NDE/UT and corrosion

estimates, such that a final determination can be made as to whether to complete the lift. Based on this determination, additional measures may be taken to further evaluate existing tank conditions, modify the lift approach, or revise the remediation approach for the PM-2A tanks.

4.3.5 Tank Transport and Placement in the TAN-607A High Bay

The tanks will be placed on the cradles previously described on a 12-axle heavy hauler for transport to the TAN-607A High Bay. Prior to placement on the cradles, a liner will be placed on the support cradles such that the tanks can be wrapped following placement on the support cradles to minimize the potential for the spread of contamination during transport (PEI-EDF-1003; Appendix C). The tanks will be secured to the heavy hauler using tie-downs to ensure that the tanks do not shift during transport to the TAN-607A High Bay (Drawing C-067-RP0003-003; Attachment 1).

Upon entering the TAN-607A High Bay the hydraulic transport trailer will lower the saddle support beams down such that they engage the pre-placed jack stands. Subsequent to the placement of the tanks into the shielded containment area, the entire enclosure will be covered with a fire retardant membrane to mitigate any potential fire (PEI-EDF-1004; Appendix C)

4.3.6 CERCLA Confirmation Sampling

During removal of the sand pad the excavated sand will be monitored to determine if there have been potential releases from the tanks. Following tank removal the tank will be inspected, to the extent practical, and the sand pad inspected further to determine if potential releases have occurred. If it is determined that a release has occurred, the sand pad and concrete cradles will be removed and disposed of as CERCLA remediation-derived waste at the ICDF or a non-INEEL facility (see Section 3.4.2 of WMP [INEEL 2004a]).

Following tank removal (and sand pad and cradle removal, if determined necessary) CERCLA confirmation samples will be collected in accordance with the FSP (DOE-ID 2004c) to confirm that the FRG has been met and to aid in the establishment of post-remediation ICs.

4.3.7 Excavation Backfill and Contouring

The TSF-26 site will be backfilled and recontoured with clean soil that meets the FRG criterion. The excavated areas will remain open until confirmation soil sampling indicates compliance with the FRGs. Backfill material (approximately 72,004 yd^3) will be obtained from the TAN gravel pit, an area known to be free of contamination above the FRGs, and approved for use as backfill materials. The soils will be backfilled in 12-in. lifts and compacted. The area will be graded to match the surrounding grade (Drawing P-FFA/CO-PM2A-009; Attachment 1).

4.3.8 Revegetation

Upon completion of the earthwork activities, all areas affected by material borrowing and stockpiling will be revegetated. The seeding and mulching will be performed in accordance with SPC-475, Section 02486, “Revegetation” (included in Attachment 2). The revegetation SPC governs the preparation, placement, composition, and species of the seed mixtures utilized. Requirements for the subsequent inspection to confirm the success of the revegetation will be addressed in the *Operations and Maintenance Plan for the Test Area North, Operable Unit 1-10* (DOE-ID 2001).

4.3.9 Institutional Controls

Institutional controls are currently implemented and being maintained for the TSF-26 site in accordance with the INEEL sitewide IC plan (DOE-ID 2003c). After completion of site remediation ICs will be reestablished based on contaminated soil remaining at the site at concentrations below 23.3 pCi/g for Cs-137. Should confirmation sampling prove that concentrations of Cs-137 are less than 2.3 pCi/g, the site will be released for unrestricted use without the implementation of institutional controls. Any changes to the IC requirements based on completion of the site remediation will be identified and incorporated into the INEEL sitewide IC plan.

4.4 Equipment, Components, and Instruments

Tables 4-1 and 4-2 list the major equipment and components that may be utilized during Phase 1 PM-2A remedial actions. This list represents the anticipated equipment that may be used, and is not all inclusive. Additional equipment may be used, as necessary.

Table 4-1. Major equipment list and description for the PM-2A tanks.

Equipment	Description
Backhoe	CASE 590T or equivalent
Bulldozer	CAT D8N or equivalent
Loader	John Deere 744E/CASE 590 or equivalent
Excavator	CASE 9060B/John Deere JD690 or equivalent
Grader	John Deere JD770 or equivalent
Compactor	CAT 815B or equivalent
Vibratory Roller	Ingersol-Rand or equivalent
Crane	Manitowoc 2250 with MAX-ER 2000
Assist crane	To be determined
DOT-approved Waste Containers	Drums, metal boxes, roll-on/roll-offs
Dump truck	Tandem 12 yd^3 Trucks
Water Truck	Tandem 6 × 3,500-gal water truck
Hydroseeder	To be determined
Fork Truck	GEHL Extenda-Boom Fork Truck or equivalent

Table 4-2. Additional support equipment for the PM-2A tanks site.

Equipment	Description
Tag Lines	1/2-in. high-strength poly rope (two each 60-ft length)
Lifting Spreader Bars	Two 16-ft spreader 100 ton spreader bars; One 22-ft 100 ton spreader bar
Steel Wedges and Shims	Commercially available
Powered Backpack Sprayer System w/Strippable Paint	Commercially available
Ambient Air Monitoring Stations	To be selected by INEEL RadCon and Industrial Hygiene/Safety Officer
Sampling/Survey Equipment	To be selected by INEEL RadCon and industrial hygiene/safety officer
Cradles/Saddles	
Heavy Hauler/Transporter/Mover, etc.	
Miscellaneous Other Equipment	Welding equipment, tools, etc.

4.5 Drawings and Specifications

The drawings and SPCs that support implementation of the design are listed below in Tables 4-3 and 4-4. The tables of drawings and SPCs below are inclusive of those that are included in Attachments 1 and 2 and those that have more detailed fabrication or installation information that are not included as attachments, but are available for information if requested.

Table 4-3. Drawings.

Drawing Number	Title	Include in RD/RAWP Addendum Submittal (Yes/No)
C-067-RP0003-002	INEEL PM-2A Tank Site Cribbing	Yes
C-067-RP0003-003	INEEL PM-2A Tank Site Transportation and Hardware	Yes
C-067-RP0003-004	INEEL PM-2A Tank Lift Lug Weldment Details	No
C-067-RP0003-005	INEEL PM-2A Tank Saddle/Support Beam Assembly	Yes
C-067-RP0003-006	Saddle Detail	No
C-067-RP0003-007	INEEL PM-2A Tank Cable Assembly	Yes
C-067-RP0003-008	INEEL PM-2A Tank Tank Lifting Details	Yes (included as part of lift plan)
C-067-RP0003-009	INEEL PM-2A Tank Trailer Route	No
C-067-RP0003-010	INEEL PM-2A Tank Tie-Down Bracket	No
C-067-RP0003-011	INEEL PM-2A Tank Wooden Spacer	No
C-110-B-44010-120	Saddle Base Support Beam	No
C-110-D-44010-121	Saddle Base Support Beam Extension	No

Table 4-3. (continued).

Drawing Number	Title	Include in RD/RAWP Addendum Submittal (Yes/No)
P-FFA/CO-PM2A-001	Tank Excavation Plan	Yes
P-FFA/CO-PM2A-002	CANCELLED (PM-2A Filter Design)	No
P-FFA/CO-PM2A-003	High Bay Assembly Shop Concrete Floor Loading Capacity	Attachment to PEI-EDF-1006 (not separated)
P-FFA/CO-PM2A-004	Secondary Containment System	Yes
P-FFA/CO-PM2A-005	PM-2A Polyethylene Sheeting	Yes
P-FFA/CO-PM2A-006	Sand Pad Removal Plan, Section, and Isometric	Yes
P-FFA/CO-PM2A-008	Crane Pad Arrangement Plot Plan	Yes
P-FFA/CO-PM2A-009	Final Contour Plan	Yes
C-1	OU 1-10 TSF-26 Surface Demolition Plan	Yes
C-2	OU 1-10 TSF-26 Subsurface Demolition Plan	Yes

Table 4-4. Specifications.

Specification Number	Title	Include in RD/RAWP Addendum Submittal (Yes/No)
ES-C-001	General Equipment Fabrication	No
ES-C-001-045	Equipment Data Sheet for Steam Generator and Pressurizer Saddle Assemblies	No
ES-C-001-120	Equipment Data Sheet for INEEL PM-2A Tank Saddles	No
ES-C-100-121	Equipment Data Sheet for INEEL PM-2A Lift Lug Weldment	No
SPC 475	Construction Specifications	Yes
	The following “selected” SPCs subdivisions were extracted from the original Group 3 RD/RAWP and are applicable to the Phase 1 PM-2A tanks remedial action	
Subdivision 01051	Construction Surveying and Staking	Yes
Subdivision 02140	Temporary Diversion and Control of Water During Construction	Yes
Subdivision 02200	Earthwork	Yes
Subdivision 02486	Revegetation	Yes
	(Additional SPC requirements for tank excavation, crane pad, and transport road are included on drawing P-FFA/CO-PM2A-001, Tank Excavation Plan)	

4.6 Design Calculations

The design calculations that support the design are listed below in Table 4-5 and are inclusive to those that are relevant to and/or support the design with respect to ARARs (included in Appendix C) and those that support other areas of the design and that are not included in the appendix, but are available for information if requested.

Table 4-5. Design calculations and analyses.

Document Number	Title	Include in RD/RAWP Addendum Submittal (Yes/No)
EDF-4718	Exposure Rate Estimates for Excavation, Extraction, Transportation, Sampling, and Storage of the TAN PM-2A Waste Tanks	No
EDF-4724	TAN TSF-26 PM-2A Tanks Corrosion Evaluation	No
PEI-EDF-1000	Independent Review and Analysis of Excavation Slopes	Yes
PEI-EDF-1001	Exposure Rate Requirements using MicroShield v. 6.02	Yes
PEI-EDF-1002	Dust Suppressant Application to the Exposed Face of the Excavation	Yes
PEI-EDF-1003	Reinforced Polyethylene Cover for PM-2A Tanks	Yes
PEI-EDF-1004	CERCLA Storage Area Secondary Containment for Storage of the PM-2A Tanks in the TAN-607A High Bay	Yes
PEI-EDF-1005	PM-2A Tank Shielding Requirements using MicroShield v. 6.02	Yes
PEI-EDF-1006	Tank Weight Evaluation	Yes
PEI-EDF-1007	TAN-607A High Bay Floor Loading Analyses and Modifications for Storage of the PM-2A Tanks	Yes
PEI-EDF-1008	Transportation of the PM-2A Tanks from the TSF-26 Site to the TAN-607A High Bay	Yes
ST-464	Tie Down Evaluation of INEEL PM-2A Tanks for On-Site Transportation	No
ST-467	Supporting Calculations for the INEEL Tanks Lifting and On-Site Transportation	No
ST-468	Finite Element Analysis of the INEEL PM-2A Holding Tanks	Yes
Lift Plan (Frm. 433.21)	Mobile Crane Lift Plan – PM-2A Tanks	Yes

5. ENVIRONMENT, SAFETY, HEALTH, AND QUALITY

Compliance with environmental requirements identified as ARARs for the PM-2A tanks remediation are incorporated into the remedial design, as discussed in Section 2 of this document. Work activities will be completed in accordance with the project-specific environmental checklist. Environmental samples to support remedial actions for the TSF-26 tanks site will be collected and managed in accordance with the *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Deactivation, Decontamination, and Decommissioning* (DOE-ID 2004d).

Worker safety and health will be ensured through compliance with the project HASP (INEEL 2004d) and implemented through INEEL work control processes. Individual and collective exposure goals will be developed for project personnel performing radiological work that are ALARA. Safe work documents, such as radiological work permits, job safety analyses, and a hazard profile screening checklist will be developed in accordance with existing INEEL procedures and systems to implement the HASP requirements. They will be modified, supplemented, or generated (as necessary) during work activities to address changing conditions onsite or revisions to work methods described in the planning documents.

The hazard classification for the PM-2A tanks activities is designated as a Less-Than-Category 3 nuclear facility. The safety category designation assigned to these activities in accordance with MCP-540 is "Consumer Grade" or Quality Level 4. However, the radioactive nature of the PM-2A tank contents and the facility classification of Less-Than-Category 3 nuclear facility requires compliance with 10 CFR 830, Subpart A, "Quality Assurance Requirements" (2004).

The need for an air permit was evaluated in Air Permitting Applicability Determinations (APAD) (see Appendix B). This APAD was based upon the maximum predicted emission rate during the entire remediation project, which would be expected during the actual treatment process. Estimated emissions during the tank removal and site remediation phase would be bounded by emissions levels assessed for the treatment phase. The APAD determined that no permitting was necessary for any phase of the operations.

6. REMEDIAL ACTION WORK PLAN

Implementation of the remedial design will include a sequence of tasks to safely and efficiently excavate and remove the PM-2A tanks with contents, transport the tanks to and place them in the TAN-607A High Bay, dispose of contaminated soil, and backfill and restore the site. This section provides a description of the work activities and work sequence to accomplish the remedial action. Additional detail is provided in the design drawings (Attachment 1) and the technical SPCs (Attachment 2).

6.1 Project Controls

Project controls include field oversight and construction management, access control, protocol and coordinating field oversight, project cost estimate, and the project schedule. These controls are described in the following subsections.

6.1.1 Field Oversight and Construction Management

The DOE-Idaho remediation project manager (PM) will be responsible for notifying the EPA and State of Idaho Department of Environmental Quality of project activities such as project startup, closeout, and inspections. The DOE-Idaho remediation PM will also serve as the single interface point for all routine contact between the Agencies, the WAG 1 PM, and the INEEL management and operations contractor.

The INEEL management and operations contractor will provide field oversight and construction management services for this project as well as field support services for health and safety, radiological control, environmental compliance, quality assurance, and landlord services. The INEEL management and operations contractor will also direct subcontractors performing work onsite, as applicable.

Visitors to the site who wish to observe activities must meet badging and training requirements necessary to enter INEEL facilities. Training requirements for visitors are described in Section 4 of the project HASP.

6.1.2 Project Cost Estimate

The cost estimate summary for Phase 1 PM-2A tanks remedial action as addressed by this work plan is presented in Appendix D.

6.1.3 Project Schedule and Deliverables

The working schedule for the Phase 1 PM-2A tanks remedial action is provided in Figure 6-1. The deliverable schedule with the planned/working schedule dates and the enforceable dates through the completion of the Phase 1 remedial action is provided in Table 6-1. Administrative and document preparation activities are based on an 8-hour, 5-day workweek, while mobilization/demobilized activities are based on a 10-hour, 6-day workweek. Lifting will be completed on a 12-hour, 7-day workweek. The working schedule for the remedial action is an accelerated schedule that does not include contingency for delays in administrative activities, document reviews, or for delays to field activities due to inclement weather.

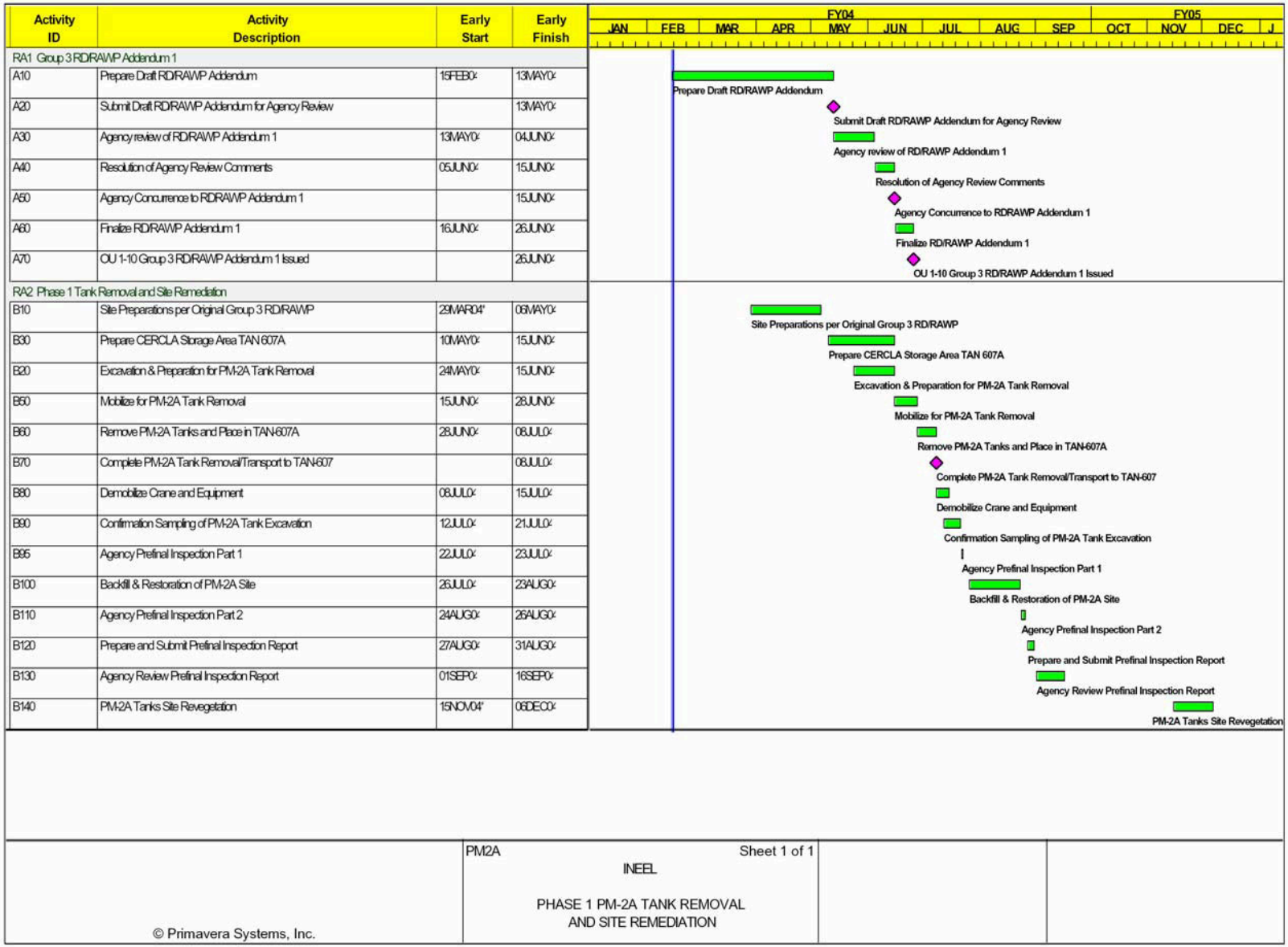

Figure 6-1. Working schedule.

Table 6-1. Deliverable schedule for the PM-2A tanks Phase 1 remedial action.

Activity	Planned Start Date	Planned Completion Date	Document Type/ Review Period[a]	Enforceable Milestone
Remedial Design (Group 3 RD/RAWP Addendum 1)				
Submittal of Draft OU 1-10 Group 3 RD/RAWP Addendum 1 to Agencies for Review	N/A	05/13/04	Primary[b]	N/A
Agency Review of Draft Group 3 RD/RAWP Addendum 1	05/14/04	06/04/04	21[b]	
Agency Agreement on Resolutions to Agency Comments and Concurrence to Allow Tank Removal to Proceed	N/A	06/15/04	11[b]	
OU 1-10 Group 3 RD/RAWP Addendum 1 Finalized and Issued	N/A	06/26/04	11[b]	
PM-2A Tanks Phase 1 Remedial Action				
(Site preparation, including tank excavation, for Phase 1 remedial action was initiated in March 2004 in accordance with the original Group 3 RD/RAWP)				
Mobilize for PM-2A Tanks Removal	06/16/04	N/A		
Complete PM-2A Tanks Removal and Transport to TAN-607A	N/A	07/09/04		
Submittal of draft pre-final inspection checklist	N/A	06/18/04		
Agency review of draft pre-final inspection checklist	06/21/04	07/05/04	15[d]	
Agency pre-final inspection Part 1	07/22/04	07/23/04		
Complete PM-2A Tanks Site Backfill and Restoration (coordinated with Group 1 surface soil)[c]	N/A	08/15/04		
Agency pre-final inspection Part 2 (excluding revegetation)[c]	08/24/04	08/26/04		
Submittal of pre-final inspection report for Agency review[c]	N/A	08/31/04	Secondary	
Agency review of pre-final inspection report[c]	09/01/04	09/16/04	15[d]	
Complete PM-2A tanks site revegetation and implementation of ICs (if required)[c]	N/A	12/07/04		

Table 6-1. (continued).

Activity	Planned Start Date	Planned Completion Date	Document Type/ Review Period[a]	Enforceable Milestone
OU 1-10 Groups 1 and 3 Remedial Action Report				
The schedule for the Group 1 and 3 Remedial Action Report will be provided in the Group 3 RD/RAWP Addendum 2 for Tank Contents Treatment and Disposal				

a. Review periods, except as noted, are consistent with Section 8.13 of the FFA/CO (DOE-ID 1991) and are stated in calendar days.

b. Expedited primary document was planned with shortened review periods and without a draft final submittal.

c. Group 3 PM-2A tanks Phase 1 activities coordinated with Group 1 TSF-26 surface soil activities.

d. A 15-day review period is provided to expedite completion of the pre-final inspection process.

6.2 Remedial Action Work Tasks

The work tasks required to perform the PM-2A tanks Phase 1 remedial action are described in this section. All remedial action activities will be performed in accordance with the requirements included in this section. The following sections provide descriptions of the remedial action work tasks planned for implementing the PM-2A tanks, Phase 1 remedial design. Section 6.2.1 identifies general tasks and Section 6.2.2 provides descriptions of the specific remediation activities that will be performed. The applicable drawings and SPCs are provided in Attachments 1 and 2. The general remedial action activity sequences are shown in Appendix H. The project supporting documents referred to in this section are identified in Table 6-2.

Table 6-2. Supporting documents.

Document Number	Title
DOE/ID-11078	*Field Sampling Plan for Group 3, PM-2A Tanks for Test Area North, Waste Area Group 1, Operable Unit 1-10*
INEEL/EXT-03-00284	*Waste Management Plan for Group 3, PM-2A Tanks and Burn Pits, for Test Area North, Waste Area Group 1, Operable Unit 1-10*
INEEL/EXT-03-00283	*Decontamination Plan for Group 3, PM-2A Tanks and Burn Pits, for Test Area North, Waste Area Group 1, Operable Unit 1-10*
DOE/ID-11076	*Hazardous Waste Management Act/Resource Conservation and Recovery Act Closure Plan for the Test Area North/Technical Support Facility Intermediate-Level Radioactive Waste Management System, Phase III: Intermediate-Level Radioactive Waste Holding Tank Subsystem (PM-2A Tanks)*
ICP/EXT-03-00056	*Contingent Field Sampling Plan for the HWMA/RCRA Closure of the TAN/TSF Intermediate-Level Radioactive Waste Holding Tank Subsystem (PM-2A Tanks)*
INEEL/EXT-03-00540	*Risk-Based Screening and Assessment Approach for Waste Area Group 1 Soils*

6.2.1 General Remedial Action Tasks

The following subsections identify the general tasks and requirements for the PM-2A tanks Phase 1 remedial action.

6.2.1.1 Access Control. Temporary access control measures will be utilized to restrict access into the work area by unauthorized personnel and prevent heavy equipment from being driven over subsurface structures (e.g., tanks and piping). Existing fencing around portions of the sites may be used to establish the access control boundaries. Contamination control boundaries will be established and marked using plastic safety fencing, ropes, etc. Ingress and egress control of contaminated areas will be defined in the project HASP (INEEL 2004d) and appropriate radiological work permits.

6.2.1.2 Pre-mobilization. Prior to mobilization for each remedial action task, all associated documentation to support the work control for that task will be prepared and approved. These activities ensure operational readiness prior to mobilization. Job safety analyses, radiological work permits, ALARA reviews, confined space entry permits, operational procedures, and other work control forms will be prepared for each major portion of the remedial action, as appropriate. Waste determination and disposition forms and waste material profiles will be prepared. Additional activities include subsurface investigations to identify lines, utilities, and subsurface structures; preparing lift plans; pre-job briefings; and equipment procurement. Start-up authority will be granted by the Clean/Close TAN project director.

6.2.1.3 Mobilization. Mobilization will begin with site preparation activities. These activities include establishing radiological control stations, monitoring locations, and control zones. Site preparation will require installing temporary barriers and signs, and establishing, registering, and equipping an approved CERCLA waste storage area. Existing site access roadways will be used where possible; additional temporary road construction will occur as specified. Mobilization will also include the sequenced delivery of equipment and personnel to the site, as needed.

6.2.1.4 Clearing and Grubbing. The sites will be cleared of shrubs, vegetation, fences, and other debris (as required), as identified in SPC 475, Subdivision 02220, “Earthwork.” Disturbance of underlying soils will be minimized during all clearing and grubbing activities, which will be performed in accordance with this SPC. The INEEL Site work forces will ensure adequate dust control measures are applied to control fugitive dust from the site during these operations.

6.2.1.5 Construction Activities. Construction operations will be confined to areas that require remediation or to areas that are required to support remediation. Any areas outside the designated locations that are damaged or disturbed will be repaired and reseeded in accordance with this plan. Construction activities include the specific remediation activities and the applicable drawings and SPCs in Attachments 1 and 2. Examples include site preparation, excavation, tank removal and transport, piping removal, and site backfill.

6.2.1.6 Soil Excavation. Contaminated soils will be excavated to the extent indicated on the tank excavation plan (Drawing P-FFA/CO-PM2A-001; Attachment 1). All excavation activities will be performed in accordance with the SPCs defined on the excavation plan drawing and SPC 475, Subdivision 02200, “Earthwork.”

Precautions such as water spray, application of fixatives, wind monitoring, and visual observations will be used to prevent the generation of fugitive dust. Air monitoring requirements will be specified by a radiological control engineer and a certified industrial hygienist. Wind monitoring and visual observations to control fugitive dust will be performed by the industrial hygienist, radiological control technician, or site health and safety officer.

Personal protective equipment, when required, will be used as specified in the project HASP (INEEL 2004d), applicable radiation work permits, and as determined by the safety officer and/or the certified industrial hygienist present at the job site.

Equipment necessary for excavation of the contaminated soils may remain within the decontamination control zones until completion of excavation activities. Barriers, such as tarps and containment pads, will be used to separate the equipment and vehicles that are used to haul excavated soil from the area to prevent the spread of contamination. These vehicles will not be driven directly onto contaminated areas. This strategy will minimize the spread of contamination and eliminate the need to perform any additional decontamination.

Contaminated soil staging piles will be managed in accordance with the requirements of the WMP (INEEL 2004a).

6.2.1.7 Earthwork. Earthwork will include excavation and transportation of soils to ICDF for disposal; excavation, hauling, and placement of backfill material; and final grading of the excavated areas. All earthwork will be performed in accordance with SPC 475, Subdivision 02220, "Earthwork."

6.2.1.8 Storm Water Control. Storm water will be controlled during remedial action so that storm water does not carry contamination from the contaminated site to adjacent non-contaminated areas. Storm water will be managed to minimize flow either onto or off of the site. Storm water may be left to infiltrate the soil. Because the TSF area at TAN is outside the storm water corridor, a storm water pollution prevention plan is not required.

6.2.1.9 Waste Management. The remedial action tasks will generate mixed low-level and low level radioactive waste. Industrial wastes may also be generated. All waste streams generated during remediation activities are identified in, and will be managed in accordance with, the project WMP (INEEL 2004a).

6.2.1.10 Confirmation and Closure Sampling. Prior to PM-2A tanks excavation backfill, confirmation sampling at depths >10 ft bgs will be performed in accordance with the project FSP (DOE-ID 2004c) to ensure that data are available to support a final determination of ICs. Collection of soil samples to support HWMA/RCRA closure may also be required based on the results of closure evaluations.

6.2.1.11 Excavation Backfill. All backfill activities will be performed in accordance with specifications SPC 475, Subdivision 02200, "Earthwork." As noted in the specifications, acceptable backfill and fill material is available at the TAN gravel pits. Approval to utilize material from the TAN gravel pit is required from the INEEL Roads and Grounds Organization.

6.2.1.12 Reclamation Seeding. Upon completion of all earthwork activities, reclamation seeding will take place on the backfilled excavations, lay down areas, and on all areas affected by the site remedial action activities. The seeding and mulching will be performed in accordance with SPC 475, Subdivision 02486, "Revegetation." Requirements for subsequent inspection to confirm that revegetation has been successful will be addressed in the next revision of the Operations and Maintenance Plan for the Test Area North, Operable Unit 1-10 (DOE-ID 2001).

6.2.1.13 Security. Security and site access control will be provided in accordance with the project HASP for each site to ensure that unauthorized personnel are not allowed access to the sites and that site conditions are controlled at all times during the remediation activities.

6.2.1.14 Institutional Controls. Institutional controls will continue to be required at the TSF-26, PM-2A tanks site after site remediation is complete. The ICs (i.e., administrative controls), including lease and property transfer restrictions, land use restrictions, and access restrictions, will be implemented per the WAG 1 IC plan (INEEL 2000).

Note: *The WAG 1 IC plan will be superseded by the INEEL sitewide IC plan for CERCLA response actions (DOE-ID 2003c) when the sitewide plan is approved by the Agencies and issued.*

6.2.1.15 Decontamination of Tools and Equipment. After completion of work activities within the contaminated areas of the site, all tools and equipment will be decontaminated, as necessary, in accordance with the project decontamination plan (INEEL 2004b).

6.2.1.16 Demobilization. After each remedial action task has been completed, equipment will be decontaminated, as necessary, support equipment will be removed from the site and access controls will be removed. All wastes will be packaged for disposal and dispositioned, as appropriate.

6.2.2 PM-2A Tanks Phase 1-Specific Remedial Action Tasks

The planned tasks for remediation of the PM-2A tanks are summarized as follows:

- Site preparation and mobilization
- Excavation for tank removal
- TAN-607A High Bay preparations
- Tank removal
- Tank transport to and placement in the TAN-607A High Bay
- CERCLA confirmation sampling
- Excavation backfill, recontouring, and topsoil placement
- Revegetation
- Institutional controls.

The following subsections identify the specific remedial action activities related to each task listed above that will be performed. Some activities that were performed to the original Group 3 RD/RAWP are included below and referenced as such. Completion of the removal of remaining Group 1, TSF-26 surface soil will be coordinated with the site preparation and mobilization, and the tank excavation tasks below.

6.2.2.1 Site Preparation and Mobilization

- Establish Site Controls—Project boundaries, roadways and vehicle access, and site access controls.
- Establish CERCLA waste storage areas.
- Locate and isolate, as necessary, utilities potentially impacted by planned remedial action tasks.

- Lock-out/tag-out all underground utilities, as needed (e.g., electrical, air, and water). This task may require some excavation to locate lines.

- Setup access control equipment.

- Stage necessary equipment.

Note: *The following activities under this task were performed in accordance with the original Group 3 RD/RAWP (DOE-ID 2003a).*

- Excavate soil to support removal of process feed and utility piping that is located within the tank removal excavation footprint.

- Remove process feed and utility piping that is located within the tank removal excavation footprint.

- Remove and containerize waste, if present, from process feed piping. Sample and manage waste in accordance with the WMP.

Note: *Treatment of waste removed from the feed piping (if required) will be addressed in Addendum 2 of the Group 3 RD/RAWP.*

- Perform soil sampling beneath the process feed piping as required by the HWMA/RCRA closure plan (DOE-ID 2004b) and contingent FSP (ICP 2004).

- Transport and dispose excavated soil at the ICDF.

- Size, package, transport and dispose feed piping at the ICDF.

6.2.2.2 Tank Excavation

Note: *Tank excavation, placement of clean fill, and construction of crane pad and transfer road may be performed in any order provided each activity can be performed without compromising the completion of the other activities.*

- Excavate the tanks as shown on the tank excavation plan drawing.

Special Note: *Exercise care during tank excavation to preclude damage to tanks.*

- During tank excavation remove the tank manway access pipe and the tank vent line. Cap or plug the vent line tank penetration.

- Transport and dispose excavated soil at the ICDF.

- Size, package, transport, and dispose of the manway access pipe and tank vent lines at the ICDF.

- Remove sand from the tank cradles to the extent practical, from the sides and ends of each tank.

Special Note: *During sand removal, visually monitor sand for staining or discoloration. Following sand removal, perform radiological monitoring of the sand and collect other radiological samples, as determined practical. (This action is necessary per the project closure plan to identify any evidence indicating a release from the tanks. If there is evidence of a release, sampling will be required per the HWMA/RCRA closure plan [DOE-ID 2004b] and contingent FSP [ICP 2004].)*

- Transport and dispose excavated soil/sand at ICDF.
- Construct the crane pad and access ramp per the SPCs identified on the tank excavation plan.
- Construct the transfer road per the SPCs identified on the tank excavation plan.

Special Note: *Follow the specific backfill material, placement, compaction testing and levelness requirements per the tank excavation plan for the crane pad and transfer road.*

- Place 6 in. of clean fill over the entire TSF-26 site (excluding tank excavation).
- As necessary, apply fixative to excavation slopes (to minimize potential for windblown contamination spread).
- Perform tank wall thickness measurements at critical locations on the tanks (locations of lifting pads, sludge/air interface where the most corrosion of the tank wall would be expected, and other areas where, based on observations during tank excavation or sand pad removal, integrity of the tanks may be in question).

Special Note*: Prior to proceeding with tank removal, wall thickness data (NDE/UT) will be evaluated to ensure that the lift can proceed safely. The results of this evaluation will be documented.*

- Perform tank radiation field measurements.

Special Note*: Prior to proceeding with tank removal, radiation field measurements will be used to evaluate if shielding design specifications require adjustment. The results of this evaluation will be documented.*

6.2.2.3 TAN-607A High Bay Preparations

- Prepare transport route from the TSF-26 site to the TAN-607A High Bay
- Remove equipment currently stored in the TAN-607A High Bay, as required
- Configure (i.e., install secondary containment, place radiological shielding, install load distribution plates, and install cribbing and jack stands) the TAN-607A High Bay for acceptance of the PM-2A tanks
- Modify shielding design, if required

Note: *Modification only required if shielding design requires adjustment based on tank radiation field measurements.*

- Install video camera system for remote inspections of the secondary containment system

- Establish the TAN-607A High Bay as a CERCLA storage area and establish additional radiological controls, as necessary.

6.2.2.4 Tank Removal

- Place temporary shielding, as necessary.
- As necessary, scrape off the exterior tar coating of each tank to facilitate welding operations (a 1/16-in.-thick tar coating is present on tank exteriors for corrosion control).
- Remove soil and debris from the exterior of each tank in accordance with the project decontamination plan.
- Weld the lifting pads on the upper portions of each tank.
- Place and secure tank support cradles on the tank transporter. Stage tank wrapping materials on the tank transporter to minimize the spread of contamination during transport.
- Lift first tank and inspect and remove residual soil/sand and debris from the bottom of the tank to the extent practical.

***Special Note**: Inspect the bottom of the tank for evidence of leakage per the HWMA/RCRA closure plan. (This action is necessary to identify any evidence indicating a release from the tanks. If there is evidence of a release, sampling of the sand and soil under the tank will be required per the HWMA/RCRA closure plan [DOE-ID 2004b] and contingent FSP [ICP 2004].)*

- Place tank in support cradles and secure to the tank transporter.

***Special Note**: After the tank is removed, inspect and survey the sand in the tank cradle and the surrounding area in accordance with the HWMA/RCRA closure plan. (This action is necessary per the project closure plan to identify any evidence indicating a release from the tanks. If there is evidence of a release, sampling of the sand and soil under the tank will be required per the HWMA/RCRA closure plan [DOE-ID 2004b] and contingent FSP [ICP 2004].)*

- Repeat steps identified above for the second tank.

6.2.2.5 Tank Transport and Placement in TAN-607A

- Transport tank to the TAN-607A High Bay
- Position tank inside the TAN-607A High Bay and adjust jack stand position, as necessary
- Lower tank onto the jack stands and pull the tank transport from the TAN-607A High Bay.

6.2.2.6 Removal of Remaining Process Feed Piping

- Excavate soil to support removal of process feed piping from the previous stopping point to the existing caps on the north side of Snake Avenue.
- Remove process feed piping up to the designated interface point.

- Remove and containerize waste, if present, from process feed piping. Sample and manage waste in accordance with the WMP.

Note: *Treatment of waste removed from the feed piping (if required) will be addressed in Addendum 2 of the Group 3 RD/RAWP.*

- Perform soil sampling beneath the process feed piping as required by the HWMA/RCRA closure plan (DOE-ID 2004b) and contingent FSP (ICP 2004).

- Transport and dispose of excavated soil at ICDF.

- Size and package feed piping for transport and disposal at ICDF.

Note: *Excavation backfill and road reconstruction may be coordinated with the tank excavation task.*

- Backfill the excavation with clean soil up to the bottom of the Snake Avenue road base.

- Place new road base and restore Snake Avenue to gravel surface condition.

6.2.2.7 Sand and Tank Cradle Removal (Contingency Task)

Note: *This task is a contingency measure that would only be required if inspection and monitoring per the HWMA/RCRA closure plan (DOE-ID 2004b) identified evidence of at release from the PM-2A tanks. The activities below are provided as an outline only. Actual activities would be determined based on the conditions found under the tanks, HWMA/RCRA closure plan requirements, and concurrence by the Agencies.*

- Remove the sand from the tank cradle

- Remove the concrete tank cradle

- Ensure bias soil samples from beneath the concrete cradles are collected per the HWMA/RCRA closure plan (DOE-ID 2004b) and contingent FSP (ICP 2004)

- Perform a CERCLA risk assessment to support a potential revision to the FRGs and a determination of the need for further actions (application of institutional controls, further remediation, or no action).

6.2.2.8 Tank System Piping Release Soil Sampling and Removal (Contingency Task)

Note: *This task is a contingency measure that would only be required if visual inspection and monitoring identifies evidence of a release from the tank system piping.*

- Ensure bias soil samples are collected per the HWMA/RCRA closure plan (DOE-ID 2004b) and contingent FSP (ICP 2004)

- Remove and containerize the contaminated soil (based on visual evidence and radiological monitoring)

- Based on HWMA/RCRA sample results, perform a CERCLA risk evaluation to determine the need to collect additional biased samples

- Collect additional biased samples, if required

Note: *Additional biased samples, if required, will be collected under a revision to the project FSP (DOE-ID 2004c) or a new FSP will be developed and submitted for Agency review and approval.*

- Perform a CERCLA risk assessment to support a potential revision to the FRGs and a determination of the need for further actions (application of institutional controls, further remediation, or no action).

6.2.2.9 Tank System Release Risk Assessment (Contingency Task)

Note: *This task is a contingency measure that would only be required if visual inspection and monitoring identifies evidence of a release from the tank system (tanks and/or piping). The activities below are provided as an outline only. Actual activities would be determined based on the conditions found, HWMA/RCRA closure plan (DOE-ID 2004b) requirements, and concurrence by the Agencies.*

- Perform a risk assessment in accordance with the project risk based screening and assessment approach to determine if any contaminants other than Cs-137 are risk drivers for cleanup and, if so, to establish new FRGs for remedial action.

6.2.2.10 Tank Excavation Confirmation Sampling

- After tank removal (and concrete cradle and sand pad removal, if necessary) is completed, perform confirmation sampling >10 ft bgs in accordance with the project FSP (DOE-ID 2004c).

Note: *Evaluate confirmation sample results to determine IC requirements.*

Special Note: *After tank removal (and concrete cradle and sand pad removal, if necessary) is completed, also perform confirmation sampling on the tank excavation areas that are from 0 to 10 ft bgs in accordance with the Group 1 FSP (DOE-ID 2004g).*

6.2.2.11 Pre-final Inspection – Part 1

After confirmation sampling is completed, perform Part 1 of the pre-final inspection in accordance with Section 6.3.1.

6.2.2.12 Excavation Area Backfill and Recontouring

After completion of confirmation sampling, associated remedial action tasks, and Part 1 of the pre-final inspection, perform tank excavation backfill, recontouring, and topsoil placement.

Note: *This task will be coordinated with the Group 1 TSF-26 backfill and recontouring.*

- Backfill the tank excavation with clean soil in accordance with SPC 475, Subdivision 02200, "Earthwork." Perform final contour grading to the existing grade surrounding the site.

Note: *Per the SPCs, the TAN gravel pit is an acceptable source of clean soil for backfill.*

- Scarify the backfilled surface and place 6 in. of topsoil over the backfilled area.
- Perform final land survey of site and record survey data.

Note: *This task is for both the Group 3 tank excavation and the Group 1 TSF-26 surface soils (entire TSF-26 site). As such, this task supercedes the same task as described in the Group 1 RD/RAWP (DOE-ID 2003a).*

6.2.2.13 Equipment Decontamination and Demobilization

- Setup equipment decontamination pads, as necessary
- Perform necessary equipment decontamination in accordance with the project decontamination plan (INEEL 2004b)
- Verify that equipment is decontaminated, or take appropriate action for contaminated items per the requirements of the project decontamination plan (INEEL 2004b)
- Demobilize equipment
- Cleanup and restore the site.

6.2.2.14 Secondary Waste Management and Disposal

- Complete disposition or disposal of all secondary wastes generated during the remedial action in accordance with the project WMP (INEEL 2004a).

Note: *Disposition means waste has been characterized, profiled, packaged, and is ready for transport to final disposal location.*

6.2.2.15 Site Access and Institutional Controls

- Reestablish site access and ICs based on the results of confirmation sampling
- Reinstall CERCLA/radiological area controls and signage, as necessary
- Reinstall IC area signage, as necessary
- Provide notice to Long-Term Stewardship that previously established ICs are to continue.

Note: *This task is for both the Group 3 tank excavation and the Group 1 TSF-26 surface soils (entire TSF-26 site). As such, this task supercedes the same task as described in the Group 1 RD/RAWP (DOE-ID 2003a).*

6.2.2.16 Records and As-Builts

- Prepare final drawings showing extent of soil excavation for the TSF-26 site and quantities of contaminated soil removed

- Prepare as-built drawings of the TSF-26 site showing final underground site conditions (e.g., underground piping), as necessary, and surface contours

Note: *This task is for both the Group 3 tank excavation and the Group 1 TSF-26 surface soils (entire TSF-26 site). As such, this task supercedes the same task as described in the Group 1 RD/RAWP (DOE-ID 2003a).*

6.2.2.17 Pre-final Inspection – Part 2

After site backfill and recontouring is completed, perform Part 2 of the pre-final inspection in accordance with Section 6.3.1.

6.2.2.18 Revegetation

Perform revegetation of the TSF-26 site in accordance with SPC 475, Subdivision 02486, "Revegetation."

Note: *Per the SPCs, revegetation will only be performed in the timeframe from November 15 to December 15.*

- Prepare the seedbed
- Fertilize
- Perform seeding using the specified INEEL "Native Grasses Mix" for TAN
- Provide notice to Long-Term Stewardship that reseeding is complete and that subsequent monitoring and maintenance of the revegetated area is required and should be included in the INEEL sitewide operations and maintenance plan (DOE-ID 2001).

Note: *This task is for both the Group 3 tank excavation and the Group 1 TSF-26 surface soils (entire TSF-26 site). As such, this task supercedes the same task as described in the Group 1 RD/RAWP (DOE-ID 2003a).*

6.3 Inspections

Upon completion of remedial action construction activities for each site, pre-final and final inspections will be performed at each site at the discretion of the Agency PMs or designees. Periodic inspections can occur at any time during remediation activities and will be conducted to finalize all project work elements. The inspections will establish compliance with the remedial design for each site and the remediation activities outlined in this RD/RAWP amendment.

6.3.1 Pre-final Inspection

Pre-final inspections are performed by the Agencies or their designees, typically at the completion of the remedial action construction activities at a given site, to determine the status of those activities and to identify outstanding construction requirements and actions necessary to resolve any issues identified.

A single pre-final inspection is planned for Phase 1 remediation to the PM-2A tanks site. This pre-final inspection will be performed in two parts: Part 1 prior to backfill of the tank excavation and

Part 2 following completion of the site remediation. Part 2 of the pre-final inspection will be performed prior to final site revegetation, with the revegetation identified as an outstanding item on the pre-final inspection checklist.

A pre-final inspection checklist will be developed for the pre-final inspection conducted at the site to document any unresolved or open items and the required actions for their resolution or completion. The checklists will contain specific project systems, components, start-up test procedures, or other areas agreed upon by the Agencies that will be inspected for acceptance of construction activities. The focus is on remedial action elements significant to meeting the requirements of the ROD. Backup sheets may be required to describe each item on the checklist and the criteria for acceptance/rejection of each item.

A draft pre-final inspection checklist will be provided to the Agencies for review and input, with a review period of 15 calendar days. Following Agency review, the checklist will be finalized for use in conducting the pre-final inspection. DOE-Idaho will notify the Agencies at least two weeks prior to the pre-final inspection date so the Agencies can make arrangements to conduct the inspection.

Results of the pre-final inspection will be documented in a pre-final inspection report, which will be issued as a DOE report and will contain the following elements:

- The names of all inspection participants.
- Specific project elements/hold points that were inspected.
- The completed pre-final inspection checklist documenting the performance of the inspection and all inspection findings.
- Open items identified during the inspections.
- Corrective actions to be taken to close open items or to correct deficiencies, acceptance criteria or standards, and planned dates for completion of the actions. A corrective action plan may be developed to address open items or deficiencies that cannot be closed during the pre-final inspection.
- Date of final inspection (if required).

The completed pre-final inspection checklist will be included as an appendix to the pre-final inspection report, which will be prepared for at the three sites. The pre-final inspection report will not be revised, but rather will be finalized in the context of the remedial action report. The schedule for conducting the pre-final inspection and submitting the pre-final inspection report is included in the overall schedule for remedial action (see Section 6.1.3).

6.3.2 Final Inspection

A final inspection may be scheduled for and conducted at the completion of the remedial action for each site. The Agency PMs will determine the need for a final inspection based on the results of the pre-final inspection. The final inspection will verify the closure of open items from the pre-final inspection and will confirm and document that the FRGs have been met. Results of the final inspection will be documented in the remedial action report.

6.4 OU 1-10 Groups 1 and 3 Remedial Action Report

A remedial action report will be prepared to address all Group 1 (TSF-06 and TSF-26 surfaces soil) and Group 3 (PM-2A tanks, TSF-03 burn pit, and WRRTF-01 burn pits) sites. The draft OU 1-10 Groups 1 and 3 remedial action report, a primary document, will be submitted within 60 days after the final inspection for OU 1-10 Group 1 and 3 sites.

The remedial action report will incorporate the results of the final inspection (or pre-final inspections if it is determined that a final inspection is not required) for each site and will include:

- Identification of the work defined in the Group 1 RD/RAWP (DOE-ID 2003a), this Group 3 RD/RAWP addendum, and subsequent addenda for each remediation site, certification that the work was performed and that FRGs have been met, and for TSF-06, TSF-26, and WRRTF-01, are protective for all residual contaminants.
    - Restatement of RAOs
    - Listing of all documents used in performing the remediation (i.e., RD/RAWP and supporting documents, work orders, environmental checklist, subcontracts, and other project documents)
    - Summary of work performed to complete the remedial action
    - Summary of sampling performed and sampling data results that support the completion of remedial action
    - Summary of other data (i.e., land survey) that support completion of remedial action
    - Summary of contaminated soil design volumes and find volumes of contaminated soil disposed of at ICDF
    - Summary of waste stream disposition (i.e., quantity generated and disposed, and disposal location)
    - Certification of remediation completion (including reference to HWMA/RCRA closure for PM-2A tanks)
- Explanation of any modifications to the RD/RAWP documentation
- Any modifications made to the remedial design during implementation of the remedial actions, including the purpose of the performed modifications and the results of those modifications
- Problems encountered during implementation of the remedial actions and resolutions to those problems
- Any outstanding items from the pre-final inspection checklist with a description of how the outstanding items were closed
- Documentation of the results of the final inspections

- An operations and maintenance plan update to address environmental monitoring and/or inspection of soil caps, if necessary

- Identification of changes to ICs based on remediation completion (to be incorporated into INEEL sitewide IC plan for CERCLA response actions (DOE-ID 2003c)

- As-built drawings showing final contours, if necessary.

If remedial action of a Group 1 or 3 site is completed significantly earlier than the other Group 1 or 3 sites, a remediation completion report may be prepared and submitted, as agreed by the Agencies. The remediation completion report would include the same information, as applicable, as the remedial action report and would be prepared as a secondary document with a 30-calendar day review period. The site covered in the remediation completion report would also be addressed the remedial action report.

6.5 Supporting Documents

The following sections provide a brief description of the documents that support the Phase 1 PM-2A remedial action activities addressed in this RD/RAWP addendum.

6.5.1 Decontamination Plan

The project decontamination plan (INEEL 2004b) specifies the methods and techniques to be used to decontaminate equipment used during remediation activities at the PM-2A tanks site and TSF-03. Because of the excavation component associated with both remedies, decontamination activities will be required for both RCRA and radiological contamination.

Prior to completing the remediation activities, all equipment and tools of significant value that were in contact with contaminated media will be decontaminated for future use. The contents of the PM-2A tanks are F001-listed hazardous and radioactive waste. Therefore, the RCRA objective of decontaminating contaminated equipment is to meet the RCRA treatment standards for hazardous debris and to allow them to be reused.

The radiological objective of decontaminating the ancillary equipment used to remediate the PM-2A tanks is to achieve free release of the equipment for unrestricted use elsewhere.

6.5.2 Field Sampling Plans

The project FSP (DOE-ID 2004c) was developed using the established EPA data quality objectives process (EPA 2000) and specifies sampling objectives, data needs, sampling locations and frequencies, sampling and analytical procedures, and the controls necessary to support the remedial actions for Phase 1 activities.

6.5.3 Health and Safety Plan

The site-specific HASP (INEEL 2004d) has been prepared to provide safety guidance for the personnel working at each remediation site. The HASP addresses the following areas of concern:

- Task-site responsibility

- Personnel training

- Occupational medical program and medical surveillance
- Safe work practices
- Site control and security
- Hazard evaluation
- Personal protective equipment
- Personnel decontamination and radiation control
- Emergency response for the project sites.

Safe work documents, such as radiation work permits and job safety analyses, will be developed in accordance with existing INEEL procedures and systems to implement the requirements of the HASP. They will be modified, supplemented, or generated (as necessary) during the work activities to address changing conditions onsite or revisions to the work methods described in the planning documents. The HASP is a working document and will be reviewed and modified accordingly as the project planning documents are developed and finalized.

6.5.4 Institutional Control Plan

Institutional controls were previously implemented at the TSF-26 site in accordance with the *Institutional Control Plan for the Test Area North Waste Area Group 1* (INEEL 2000). Current ICs are not expected to change after the remediation of the PM-2A tanks.

Note: *The WAG 1 IC plan will be superseded by the INEEL sitewide IC plan for CERCLA response actions (DOE-ID 2003c) when the sitewide plan is approved by the Agencies and issued.*

Upon completion of a remedial action, necessary changes to the ICs will be incorporated into INEEL sitewide IC plan for CERCLA response actions.

6.5.5 Operations and Maintenance Plan

Operations and maintenance activities for the PM-2A tanks site is covered in the *Operations and Maintenance Plan for the Test Area North, Operable Unit 1-10* (DOE-ID 2001). A revision to the O&M plan will be made, if necessary, following completion of site remediation to address changes in O&M requirements. This revision to the O&M plan will include requirements for inspection to ensure that site revegetation has been successful. These changes will be reviewed by the Agency PMs and implemented.

6.5.6 Spill Prevention and Response Program

A separate spill prevention and response plan is not necessary to implement the remedial actions. Any inadvertent spill or release of potentially hazardous materials will be addressed in "Hazardous Substance/Waste Spill Control, TAN Operating and Maintenance Procedures" (EAR-17, 2004). In the event of a spill, the emergency response plan contained in EAR-17 will be activated. All materials and substances on the work site will be stored and handled in accordance with the applicable regulations and will be stored in approved containers.

6.5.7 Waste Management Plan

The project WMP (INEEL 2004a) is a supporting document to this Group 3 RD/RAWP. The WMP identifies the waste streams anticipated to be generated during implementation of the remedial action and details the strategies for waste characterization, minimization, storage, packaging, labeling and transportation, and disposal. Anticipated waste streams include, but are not limited to, soil, piping, debris, and decontamination water from sampling and equipment decontamination activities. Waste minimization and segregation strategies and techniques are incorporated into the remedial design for each site and listed in the WMP (INEEL 2004a). The strategy for staging of storage piles is also detailed in the WMP.

6.5.8 Work Planning Documentation

The work control is based on the requirements established in this RD/RAWP addendum and facilitates preparation of the project-specific HASP, as necessary, and work authorization documents. The strategies for implementing the remedy are discussed, as are the resources needed and the procedures and protocols to be followed. As internal contractor documents, the work planning documentation is not submitted to the Agencies for review.

6.5.9 HWMA/RCRA Closure Plan and Contingent Field Sampling Plan

The HWMA/RCRA closure plan (DOE-ID 2004b) and contingent FSP (ICP 2004) outline criteria necessary to verify closure under RCRA, and specify sampling necessary based on observed field conditions to ensure that FRGs for the site adequately address HWMA/RCRA contaminants of concern.

6.5.10 Risk-Based Screening and Assessment Approach for Waste Area Group 1 Soils

The risk-based screening and assessment approach for WAG 1 soils provides a process to evaluate selected existing and new soil contamination sites at TAN to determine if contaminant risk drivers may be present in addition to, or other than, Cs-137. This screening and assessment may be triggered if evidence of a release from the PM-2A tank system is encountered.

Results of the screening and assessment, if required and performed, is provided to the Agencies informally on a conference call and formally in a risk-based assessment report.

7. CHANGES TO REMEDIAL DESIGN/REMEDIAL ACTION DOCUMENTS

7.1 Changes to OU 1-10 RD/RA Scope of Work

Changes to the original OU 1-10 RD/RAWP scope of work (DOE-ID 2000) with respect to the overall Group 3 site remediation are addressed in Section 7 of the original Group 3 RD/RAWP (DOE-ID 2003a). The changes addressed in the original Group 3 RD/RAWP with respect to the PM-2A tanks are no longer valid, since the PM-2A tanks remedy was subsequently changed in the OU 1-10 ROD amendment and ESD for the PM-2A tanks (DOE-ID 2004a).

Except where noted otherwise, the remediation approach for the PM-2A tanks described in the original Group 3 RD/RAWP (DOE-ID 2003a) is superceded by the approach presented in this RD/RAWP addendum and that to be presented in RD/RAWP Addendum 2.

7.2 Control of Changes to RD/RAWP Addenda

The need for changes to this RD/RAWP addendum and supporting documents (RD/RA documents) will inevitably arise during the implementation of the remedial action. Identification and rapid resolution of issues and disposition of changes is critical to successful project implementation under the accelerated schedule for remedial action. To support the accelerated implementation of the remedial action the following protocol is established to cover resolution of issues and disposition of proposed changes:

- All significant issues and proposed major changes will be brought to the attention of the Agencies via periodic conference calls and/or status meetings. Items of significant importance may be addressed in impromptu conference calls and/or meetings.

- The significance of proposed changes will be assessed and determined as minor or major. In addition, major changes will be assessed to determine if they may affect the requirements of the OU 1-10 ROD or ROD amendment and ESD for the PM-2A tanks, and be either significant or fundamental as defined in EPA guidance, *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and other Remedy Selection Decision Documents* (EPA 1999).

- Changes that are determined to be significant or fundamental will be addressed per the FFA/CO established protocol.

- Major changes will be defined as changes that have a substantive affect on the remedial design/remedial action documents in terms of how the remedy is designed or the remedial action is implemented. Minor changes are those changes that do not have a substantive affect.

- Proposed major changes will be provided to the Agencies for review.

- Agency agreement on how to resolve issues and/or disposition proposed major changes will be recorded in the conference call minutes or will be documented by email.

- The INEEL change control procedures will be used to implement both major and minor changes. Agency concurrence on major changes will be noted on the change control documentation.

- Subsequent revisions to RD/RA documents to incorporate the changes will note that Agency concurrence on the major changes was previously obtained and reference the conference call minutes or email where the concurrence was documented

- Change control documents and revisions to RD/RA documents will be subsequently transmitted to the Agencies.

8. FIVE-YEAR REVIEW

Requirements for five-year reviews are provided in Section 8 of the original Group 3 RD/RAWP (DOE-ID 2003a). However, based on Agency agreement, the submittal date for the draft five-year review report is changed from February 28, 2005, to June 30, 2005. This submittal date change will allow the first five-year review for OU 1-10 to be performed as part of the INEEL sitewide review and be documented in the INEEL sitewide five-year review report. The five-year review for OU 1-10 will be performed in accordance with the *INEEL Sitewide Five-Year Review Plan for CERCLA Response Actions* (DOE-Idaho 2004).

9. REFERENCES

10 CFR 830, Subpart A, 2004, "Quality Assurance Requirements," *Code of Federal Regulations*, Office of the Federal Register, January 1, 2004.

40 CFR 61, 2004, "National Emission Standards for Hazardous Air Pollutants," *Code of Federal Regulations*, Office of the Federal Register, February 9, 2004.

40 CFR 144, 2003, "Underground Injection Control Program," *Code of Federal Regulations*, Office of the Federal Register, July 1, 2003.

40 CFR 261, 2003, "Identification and Listing of Hazardous Waste," *Code of Federal Regulations*, Office of the Federal Register, July 1, 2003.

40 CFR 262, 2003, "Standards Applicable to Generators of Hazardous Waste," *Code of Federal Regulations*, Office of the Federal Register, July 1, 2003.

40 CFR 264, 2003, "Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," *Code of Federal Regulations*, Office of the Federal Register, July 1, 2003.

40 CFR 268, 2003, "Land Disposal Restrictions," *Code of Federal Regulations*, Office of the Federal Register, July 1, 2003.

40 CFR 300, 2003, "National Oil and Hazardous Substances Pollution Contingency Plan," *Code of Federal Regulations*, Office of the Federal Register, July 1, 2003.

40 CFR 761, 2003, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions," *Code of Federal Regulations*, Office of the Federal Register, July 1, 2003.

42 USC 6901 et seq., 1976, "Resource Conservation and Recovery Act of 1976," as amended.

42 USC 9601 et seq., 1980, "Comprehensive Environmental Response, Compensation, and Liability Act of 1980," as amended. (NOTE: The 1986 amendment is cited as "Superfund Amendments and Reauthorization Act of 1986" [SARA].)

49 CFR 172, 2003, "Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements," *Code of Federal Regulations*, Office of the Federal Register, October 1, 2003.

49 CFR 173, 2003, "Shippers--General Requirements for Shipments and Packagings," *Code of Federal Regulations*, Office of the Federal Register, October 1, 2003.

49 CFR 178, 2003, "Specifications for Packagings," *Code of Federal Regulations*, Office of the Federal Register, October 1, 2003.

49 CFR 179, 2003, "Specifications for Tank Cars," *Code of Federal Regulations*, Office of the Federal Register, October 1, 2003.

55 FR 46, Final Rule, "National Oil and Hazardous Substances Pollution Contingency Plan," *Federal Register*, U.S. Environmental Protection Agency, March 9, 1990, pp. 8666 et seq.

ASTM D 698, "Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5-lb (2.49-kg) Rammer and 12-in. (304.8-mm) Drop," American Society for Testing and Materials.

DOE O 231.1, 1996, "Environment, Safety and Health Reporting," U.S. Department of Energy, Change 2, November 7, 1996.

DOE O 414.1A, 2001, "Quality Assurance," U.S. Department of Energy, Change 1, July 12, 2001.

DOE O 435.1, 2001, "Radioactive Waste Management," U.S. Department of Energy, Change 1, August 28, 2001.

DOE O 470.1, 1995, "Safeguards and Security Program," U.S. Department of Energy, Change 1, September 28, 1995.

DOE O 5400.5, 1993, "Radiation Protection of and Public and the Environment," U.S. Department of Energy, Change 2, January 7, 1993.

DOE O 5480.4, "Environmental Protection, Safety, and Health Protection Standards."

DOE-ID, 1991, *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory*, Administrative Record No. 1088-06-29-120, Department of Energy Idaho Operations Office; Environmental Protection Agency, Region 10; State of Idaho, Department of Health and Welfare, December 9, 1991.

DOE-ID, 1993, *Remedial Design and Remedial Action Guidance for the Idaho National Engineering Laboratory*, DOE/ID-12584-152, Rev. 2, 1993.

DOE-ID, 1997, *Comprehensive Remedial Investigation/Feasibility Study for the Test Area North Operable Unit 1-10 at the Idaho National Engineering and Environmental Laboratory*, DOE/ID-10557, Rev. 0, November 1997.

DOE-ID, 1999, *Final Record of Decision for Test Area North, Operable Unit 1-10*, DOE/ID-10682, Rev. 0, Department of Energy Idaho Operations Office; Environmental Protection Agency, Region 10; and Idaho Department of Health and Welfare, Division of Environmental Quality, October 1999.

DOE-ID, 2000, *Test Area North, Waste Area Group 1, Operable Unit 1-10 Remedial Design/Remedial Action Scope of Work*, DOE/ID-10723, February 2000.

DOE-ID, 2001, *Operations and Maintenance Plan for Test Area North, Operable Unit 1-10*, DOE/ID-10711, Rev. 1, 2001.

DOE-ID, 2003a, *Remedial Design/Remedial Action Work Plan for Group 3, PM-2A Tanks and Burn Pits for Test Area North, Waste Area Group 1, Operable Unit 1-10*, DOE/ID-11073, Rev. 0, December 6, 2003.

DOE-ID, 2003b, *ICDF Complex Waste Acceptance Criteria*, DOE/ID-10881, Rev. 1, July 2003.

DOE-ID, 2003c, *INEEL Sitewide Institutional Controls Plan for CERCLA Response Actions,* DOE/ID-11042, April 2003.

DOE-ID, 2004a, *Record of Decision Amendment for the V-Tanks (TSF-09 and TSF-18) and Explanation of Significant Differences for the PM-2A tanks (TSF-26) and TSF-06, Area 10, at Test Area North, Operable Unit 1-10 at the Idaho National Engineering and Environmental Laboratory, Idaho Falls, Idaho*, DOE/ID-10682 Amendment, Rev. 0, February 2004.

DOE-ID, 2004b, *Field Sampling Plan for Group 3, PM-2A Tanks for Test Area North, Waste Area Group 1, Operable Unit 1-10*, DOE/ID-11078, Rev. 1, June 2004.

DOE-ID, 2004c, *Hazardous Waste Management Act/Resource Conservation and Recovery Act Closure Plan for the Test Area North/Technical Support Facility Intermediate-Level Radioactive Waste Management System, Phase III: Intermediate-Level Radioactive Waste Holding Tank Subsystem (PM-2A Tanks)*, DOE/ID-11076, Rev. 3, February 2004.

DOE-ID, 2004d, *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Deactivation, Decontamination, and Decommissioning*, DOE/ID-10587, Rev. 8, March 24, 2004.

DOE-ID, 2004e, *Idaho National Engineering Laboratory Waste Acceptance Criteria,* DOE/ID-01-10381, Rev. 19, April 2004.

DOE-ID, 2004f, *Waste Acceptance Criteria for the ICDF Landfill*, DOE/ID-10865, Rev. 6, April 2004.

DOE-ID, 2004g, *Field Sampling Plan for the Remedial Action Sampling and Field Screening of Group 1 Sites at Waste Area Group 1, Operable Unit 1-10*, DOE/ID-10725, Rev. 4, April 2004.

DOE-Idaho, 2004, *INEEL Sitewide Five-Year Review Plan for CERCLA Response Actions*, DOE/NE-ID-11125, Revision 0, April 2004.

DOE-STD-1090-2001, 2001, "Hoisting and Rigging," Department of Energy, April 2001.

EAR-17, 2004, *"Hazardous Substance/Waste Spill Control, TAN Operating and Maintenance Procedures,"* Rev. 7, January 8, 2004.

EPA, 1999, *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and other Remedy Selection Decision Documents*, EPA 540-R-98-031, OSWER 9200.1-23P, July 1999.

EPA, 2000, *Data Quality Objective Process for Hazardous Waste Site Investigations*, EPA QA/G-4HW, EPA/600/R-00/007, January 2000.

Hain, K. E., DOE-ID, to W. Pierre and D. Nygard, IDEQ, August 27, 2003, "Transmittal of Validated Data for Calendar Year 2003 TSF-06 and TSF-26 Soil Characterization Sampling for Operable Unit 1-10, Waste Area Group 1, at Test Area North – (EM-ER-03-213)."

HWMA, 1983, "Hazardous Waste Management Act of 1983," Idaho Code Sections 39-4401 et seq.

ICP, 2004, *Contingent Field Sampling Plan for the HWMA/RCRA Closure of the TAN/TSF Intermediate-Level Radioactive Waste Holding Tank Subsystem (PM-2A Tanks)*, ICP/EXT-03-00056, Rev. 2, Idaho Completion Project, Idaho Falls, Idaho, February 18, 2004.

IDAPA 58.01.01, "Rules for the Control of Air Pollution in Idaho," Idaho Administrative Procedures Act, Idaho Department of Environmental Quality, as amended.

IDAPA 58.01.05, "Rules and Standards for Hazardous Waste," Idaho Administrative Procedures Act, Idaho Department of Environmental Quality, as amended.

INEEL, 2000, *Institutional Control Plan for the Test Area North Waste Area Group 1*, INEEL/EXT-2000-00917, Rev. 0, September 2000.

INEEL, 2003, *Field Sampling Plan for the TSF-26, PM-2A Tank Contents at Waste Area Group 1, Operable Unit 1-10*, Rev. 1, June 2003.

INEEL, 2004a, *Waste Management Plan for Group 3, PM-2A Tanks and Burn Pits, for Test Area North, Waste Area Group 1, Operable Unit 1-10*, INEEL/EXT-03-00284, Rev. 1, June 2004.

INEEL, 2004b, *Decontamination Plan for Group 3, PM-2A Tanks and Burn Pits, for Test Area North, Waste Area Group 1, Operable Unit 1-10*, INEEL/EXT-03-00283, Rev. 1, June 2004.

INEEL, 2004c, *Operating Plan for the Test Area North Demolition Landfill at the Idaho National Engineering and Environmental Laboratory*, INEEL/EXT-03-00714, Revision 1, March 2004 (INEEL 2004c).

INEEL, 2004d, *Health and Safety Plan for the Group 3 Remedial Design/Remedial Action Sampling, Excavation, Backfilling, Packaging, and Shipment of Soil at Waste Area Group 1, Operable Unit 1-10*, INEEL/EXT-03-00046, Rev. 5, March 25, 2004.

MCP-540, 2001, "Documenting the Safety Category of Structures, Systems, and Components," Rev. 13, March 2001.

MicroShield, Version 6.02, Onley, Maryland: Grove Engineering, 2003.

TFR-234, 2004, "Technical and Functional Requirements for the Remediation of PM-2A Tanks, TSF-26, Operable Unit 1-10," Rev. 2, March 22, 2004.